

Service Manual

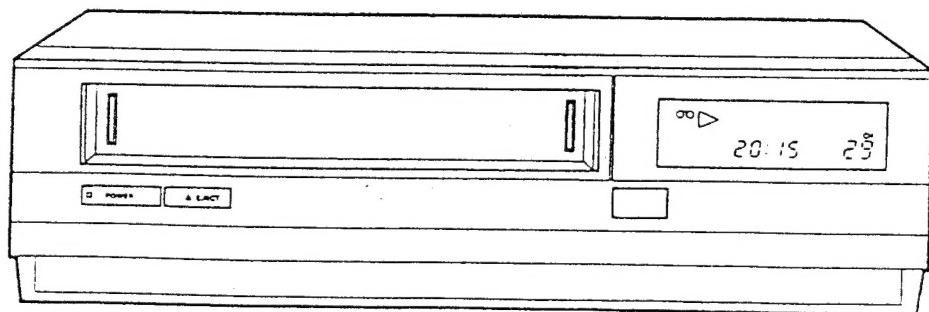
ORIGINAL VERSION

VIDEO CASSETTE RECORDER



HIGH QUALITY PICTURE

OTAKE
MODEL VCR-L2



MFR'S VERSION

Specifications are subject to change without notice.

MFR'S VERSION
A

SPECIFICATIONS

| | |
|--------------------------|---|
| Power Source : | 220V 50Hz |
| Power Consumption : | Approx. 26W |
| Operating Temperature : | 5°C to 40°C |
| Television System : | CCIR : 625 lines, 50 fields PAL and NTSC color signal |
| Video Recording System : | 2 rotary heads, helical scanning system Luminance : FM azimuth recording Color signal : Converted subcarrier phase shift recording |
| Audio Track : | 1 track |
| Tape Format : | Tape width 12.7mm high density tape |
| Tape Speed : | 23.39mm/s |
| Heads : | Video : 2 rotary heads Audio/Control : 1 stationary head |
| Input Level : | Erase : 1 full track erase head Video : VIDEO IN connector 1.0Vp-p, 75 ohm unbalanced Audio : LINE IN jack - 8 dB, 50K ohm unbalanced |
| Output Level : | Video : VIDEO OUT connector 1.0Vp-p, 75 ohm unbalanced Audio : LINE OUT jack - 6 dB, 1K ohm unbalanced |

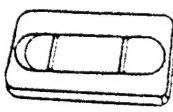
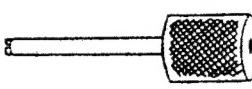
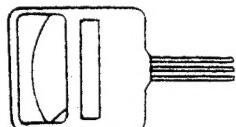
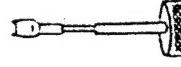
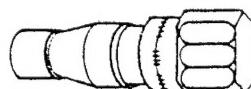
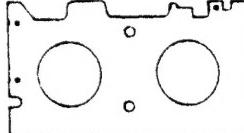
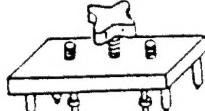
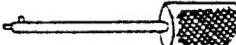
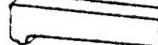
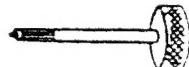
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HQ FEATURE

This video cassette recorder marked "HQ" incorporates VHS high quality picture technology. A built-in detail enhancer is used to boost the recorded signal and provide maximum picture quality in playback. It is compatible with other VHS video cassette recorders.

SERVICING FIXTURES AND TOOLS

| | | |
|---|---|--|
| JG001 VHS Alignment Tape | JG005 Post Adjustment Screwdriver | JG026 Post Adjustment Chip |
|  |  |  |
| Back Tension Meter (Tentelometer, Made in U.S.A.) | JG021 X-hut Adjustment Screwdriver | JG027 Playback Tension Torque Gauge |
|  |  |  |
| JG002D Dial Torque Gauge (300~2400g) JG002E (10~90g) JG002G (100~1200g) | JG022 Master Plane | JG031 Upper Drum Fixing Jig |
|  |  |  |
| JG004 Fine Adjustment Screwdriver | JG024 Reel Table Height Chip | JG032 Adjustment Screwdriver |
|  |  |  |

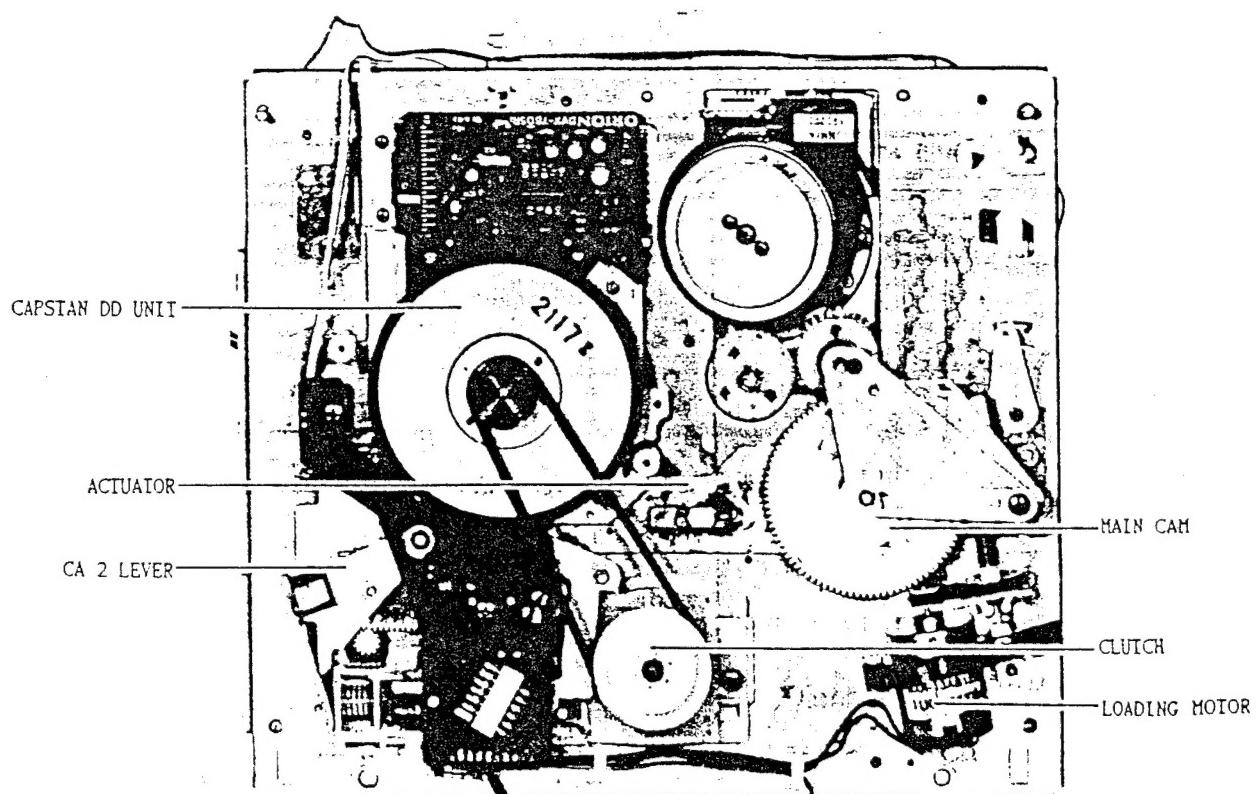
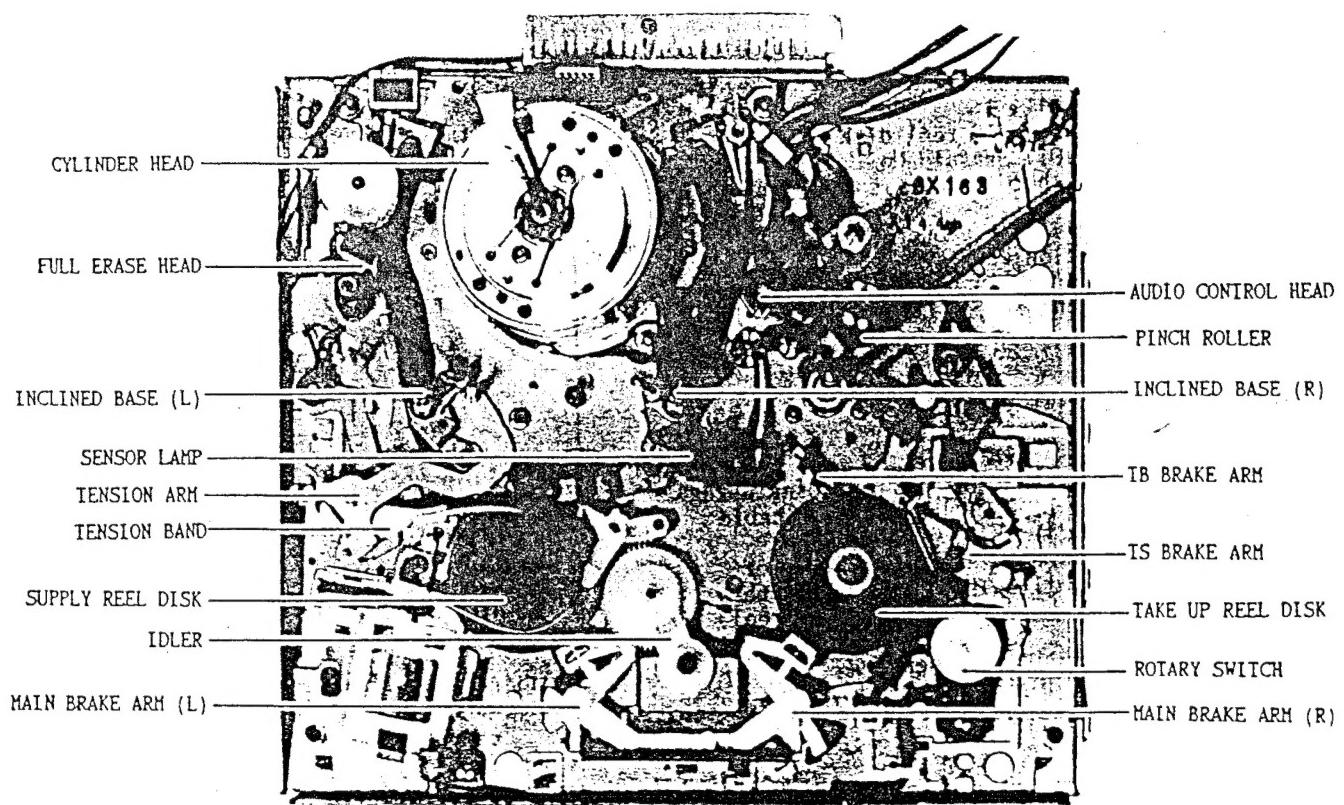
PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental condition and usage. And unless the maintenance service is properly carried out, the following intervals may be quite shortened and also a harmful effect may be had on the other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

| Parts Name | Time hours | 500 hours | 1,000 hours | 1,500 hours | 2,000 hours | 3,000 hours | Notes |
|-------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--|
| Head, Full Erase | <input type="checkbox"/> | Clean those parts in contact with the tape. |
| Head, Audio Control | <input type="checkbox"/> | |
| Belt, Loading | | <input type="checkbox"/> | | <input type="checkbox"/> | | | Clean the rubber, and part which the rubber touches. |
| Belt, Reel | | <input type="checkbox"/> | | <input type="checkbox"/> | | | |
| Pinch Roller | <input type="checkbox"/> | |
| Capstan DD Unit | | | | | <input type="checkbox"/> | | |
| Motor, Loading | | | | | <input type="checkbox"/> | | |
| Tension Band Ass'y | | | | | <input type="checkbox"/> | | |
| Capstan Shaft | <input type="checkbox"/> | |
| Impedance Roller | <input type="checkbox"/> | Need to replace when rolling comes to be abnormal. |
| Tape Running Guide Post | <input type="checkbox"/> | |
| Unit, Cylinder | <input type="checkbox"/> | Clean the upper drum (especially the video heads) in the direction of drum rotation using a thick, textured cloth with a high-quality methyl alcohol. Avoid wiping vertically as this may cause damage to the video heads. |

: Replace : Clean

DECK PARTS LOCATION



INTERCHANGEABILITY METHODS AND ADJUSTMENT

• PRECAUTION

○ Remove the following items before adjusting the Deck and then start working.

1. Top Cabinet (2 screws)
2. Bottom Plate (5 screws)
3. Front Panel
4. Shield Plate (2 screws)
5. Stage
(Refer to STAGE REMOVAL AND INSTALLATION)

Carefully read each item in • NOTE sections before starting work.

To operate Deck with stage removed from the unit.

- * Short the Cassette In Switch Terminal with the Deck Chassis.
- * Place an object which weighs between 350g and 500g on the Video Tape to keep it steady while using the Video Cassette Tape. (Do not place an object which weighs over 500g.)

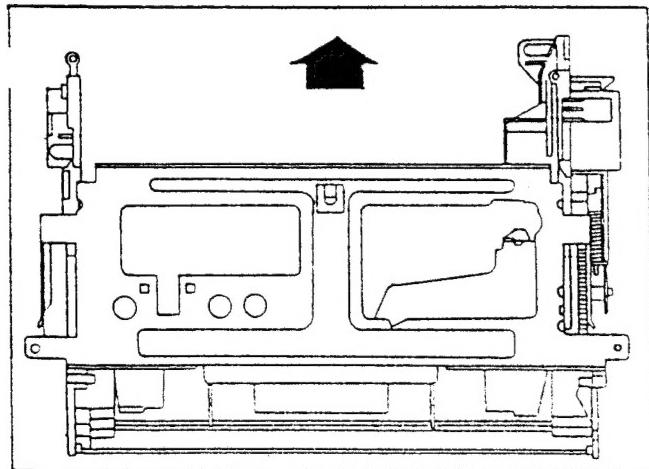
HOW TO REMOVE AND INSTALL STAGE

• REMOVAL

1. Disconnect the 8th pin connector (CP1001), which has been connected to the stage PCB, from the system control PCB.
2. Remove the 2 screws held to inside panel.
3. Remove the 2 screws (Tapping (Bo) 3x10, Red) while stage is locked when power switch is OFF.
4. Push the stage toward arrow mark, and lift up to remove the stage.

• NOTE

1. When you remove and install the stage, be careful not to touch guide pin or cylinder head.
2. Be careful not to break connectors or cut leads.



• HOW TO INSTALL

1. Set the stage and hold with the 2 screws (Tapping (Bo) 3x10, Red).
2. Attach the 2 screws to inside panel.
3. Connect the 8th pin connector(CP1001), which comes from stage, to system control PCB.

• NOTE AFTER INSTALLATION

1. Check the following:

- a. Make sure that the Front Loading Operation works well when turning on the power and when inserting a cassette pack into the stage.
- b. If it begins play mode after Play Button is pushed.
- c. If it begins recording mode after Recording Button is pushed.
- d. If it ejects after Eject Button is pushed.

• NOTE

1. Under this operation system, the end sensor and the start sensor are opened. So the auto rewind at the end of the tape will not work.
2. When you want to make tape run without the stage, use an object which weighs approximately 500g.

■ A-1: REPLACEMENT OF REEL DISK AND CONFIRMATION OF ITS HEIGHT

• REMOVAL

(Supply Reel Disk)

1. Remove the SS Brake Spring from the Loading Base.
2. Remove the SS Brake.
3. Remove the tension band.
4. Remove the polyslider washer ①.
5. Separate the mechanical brake from the reel disk.
6. Pull the supply reel disk ③ upward and replace it.

(Take-up Reel Disk)

1. Remove the IB Brake.
2. Remove the polyslider washer ①.
3. Separate the mechanical brake from the reel disk.
4. Pull the take-up reel disk ④ upward and replace it.

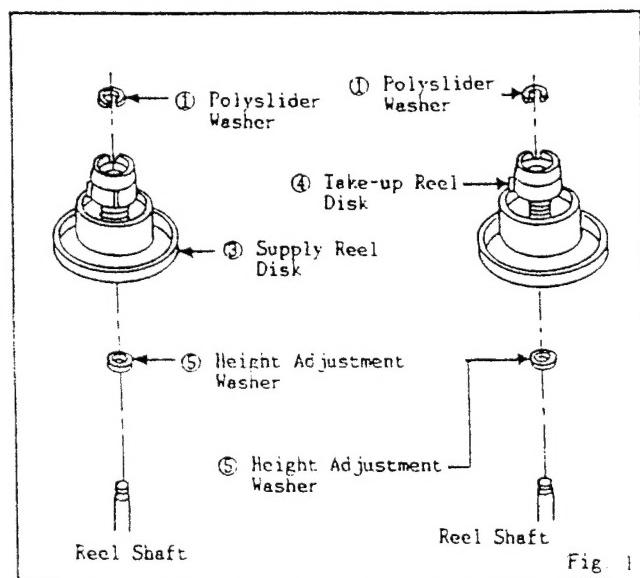


Fig. 1

● INSTALLATION

(Supply Reel Disk)

- Clean the reel disk shaft and put in height adjusting washer ⑤.
- Install new supply reel disk.
- Make height adjustment of the reel disk using the master plane (JG022) and the reel table height chip (JG024).
- Pull out the new supply reel disk. After oiling (Maruzen Oil Swafuld No.100) on the reel disk shaft, hold the new supply reel disk again.
- Install the polyslider washer ①.
- Install the tension band.
- Install the SS Brake in the chassis.
- Install the Spring in the Loading Base.

(Take-up Reel Disk)

- Clean the reel disk shaft and put in height adjusting washer ⑤.
- Install new take-up reel disk.
- Make height adjustment of the reel disk using the master plane (JG022) and the reel table height chip (JG024).
- Pull out the new reel take-up disk. After oiling (Maruzen Oil Swafuld No.100) on the reel disk shaft, hold the new take-up reel support again.
- Install the polyslider washer ①.
- Install the take-up side (IS) Brake.

● NOTE

- Make height adjustment of the reel disk after replacement.
- Be careful not to deform the tension band at the time of removal and installation.
- Be careful not to deform the IS Brake.
- Be careful not to scratch the reel disk shaft by the polyslider washer or tool at the time of removal and installation.
- After installation adjust the tension post position and the tape tension when playing back in accordance with ■A-7.
- Refer to ■A-2 for reel disk height adjustment.

A-2: HEIGHT CONFIRMATION AND ADJUSTMENT

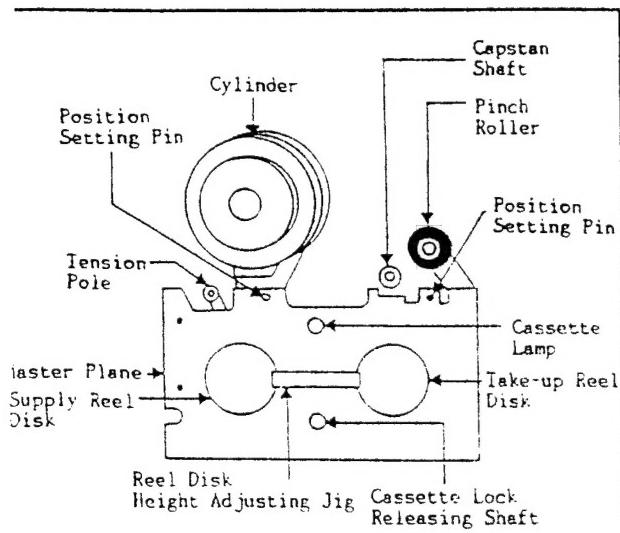


Fig. 2-a

ADJUSTMENT

- Set the master plane (JG022) at mechanism framework, taking care not to scratch the drum, as shown in Fig. 2-a.

- Confirm that the master plane (JG022) sits between A and B, as shown in Fig. 2-b, using the reel table height chip (JG024). In case it is beyond the range of set-up value, adjust it by the height adjusting washer, making up-down play within 0.1~0.5mm.

● NOTE

- Use same thickness adjustment washer (REF#521) as found in unit.

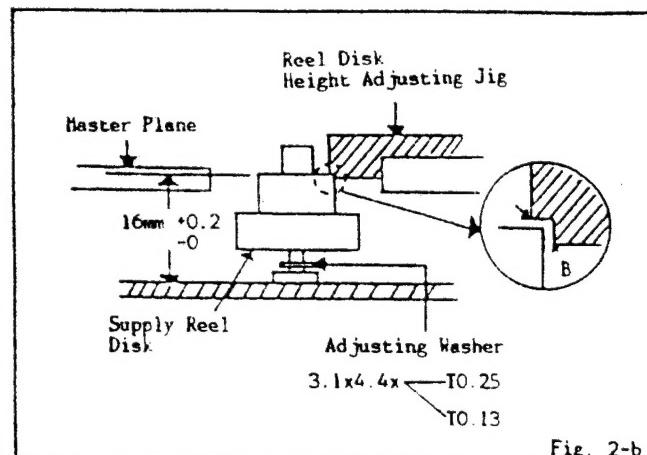


Fig. 2-b

NOTE: Refer to the table below for possible cause of problems when confirmation cannot be made for the indicated items.

| CONFIRMATION ITEM | CHECK POINT (REPLACEMENT) |
|--------------------------|--|
| A-3 A-4 A-5 A-7 | Capstan belt may be stretched clutch may be worn out (if so, change reel disk) Idler Ass'y may be worn out. |
| A-6 A-8 | Tension band may be worn out. |
| A-15 | Main brake belt may be worn out. |

LIST OF CONFIRMATION ITEM:

- A-3 Fast forward and its take-up torque confirmation
- A-4 Rewind and its take-up torque confirmation
- A-5 Record take-up torque confirmation
- A-6 Confirmation of fast forward back tension
- A-7 Confirmation of rewind
- A-8 Confirmation of search cue back tension
- A-15 Confirmation of reel brake torque

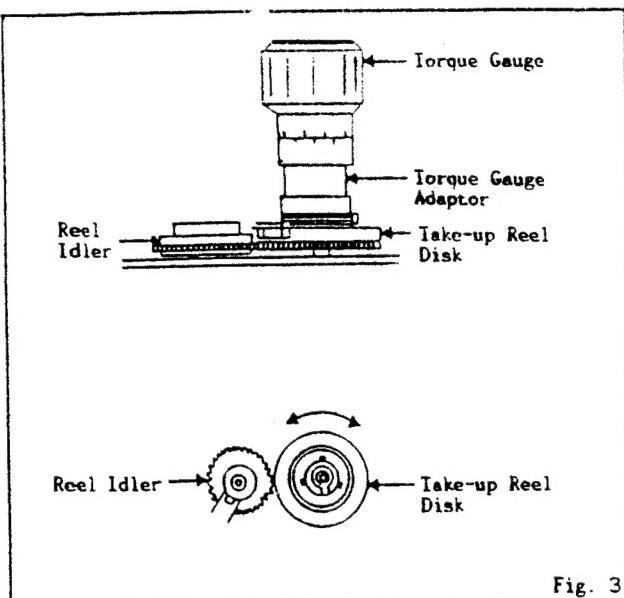
■ A-3: CONFIRMATION OF FAST FORWARD AND ITS TAKE-UP TORQUE

● CONFIRMATION

- Set torque gauge (JG002D) on take-up reel disk, and place unit in fast forward mode.
- Confirm that torque is more than 800g.cm.

● NOTE

- Hold the torque gauge (JG002D) in place when you push Fast Forward Button and reel disk begins to turn, after setting torque gauge (JG002D) on the reel disk.
- Carry out this confirmation and adjustment without using a video cassette tape.



■ A-4: CONFIRMATION OF REWIND AND ITS TAKE-UP TORQUE

● CONFIRMATION

1. Set the torque gauge (JG002D) on the supply reel disk, and place the unit in rewinding mode.
2. Confirm that torque is more than 800g.cm.

● NOTE

1. Hold the torque gauge (JG002D) in place when you push the Rewind Button, and the reel disk begins to turn, after setting the torque gauge (JG002D) on the reel disk.
2. Carry out this confirmation and adjustment without using a video cassette tape.

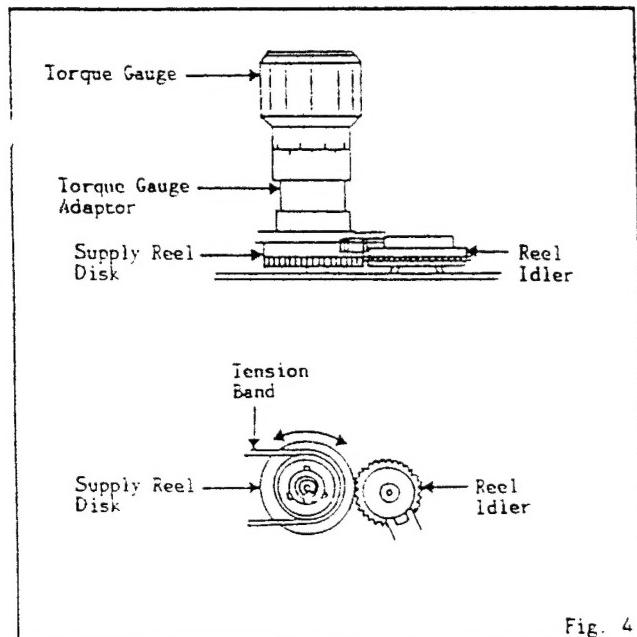


Fig. 4

■ A-5: CONFIRMATION OF RECORDING TAKE-UP TORQUE

● CONFIRMATION

1. Set torque gauge (JG027) on the rewind reel disk, then check REC mode.
2. Make sure that the torque covers the range, 100~230g.cm.

■ A-6: CONFIRMATION OF FAST FORWARD BACK TENSION

● CONFIRMATION

1. Set the unit in the fast forward mode by pushing Fast Forward Button.
2. Put the torque gauge (JG002E) on the supply reel disk and make slow right turn (one turn in a few seconds). And confirm the torque is within set-up value (15~35g.cm).

● NOTE

1. Put the torque gauge (JG002E) on the reel disk steadily and measure.

■ A-7: CONFIRMATION OF REWIND

● CONFIRMATION

1. Set the unit in the rewind mode by pushing Rewind Button.
2. Put the torque gauge (JG002E) on the take-up reel disk and make slow left turn (one turn in a few seconds) and confirm the torque is within set value (30~60g.cm).

● NOTE

Put the torque gauge (JG002E) on the reel disk steadily and measure.

■ A-8: CONFIRMATION OF SEARCH CUE BACK TENSION

● CONFIRMATION

1. Set the unit in the play mode by pushing Play Button.
2. Push Search Cue Button and the unit will be in the search cue mode. Confirm SS brake is working on the supply reel disk.
3. Put the torque gauge (JG002E) on the supply reel disk and make slow right turn (one turn in a few seconds). Measure torque of this and confirm it satisfies set-up point (above 90g.cm).

● NOTE

1. After positioning the tension arm, conduct confirmation and adjustment of visual search cue back tension.
2. Put the torque gauge (JG002E) on the reel disk steadily and measure. In case the torque gauge is playing, correct measurement will not be done.

■ A-9, 10, 11: NOT REQUIRED FOR THIS MODEL

■ A-12 CONFIRMATION AND ADJUSTMENT OF TENSION POLE POSITION

● CONFIRMATION

1. Load the E-180 tape, and press the PLAY button to set the playback mode.
2. As soon as guide rollers, L, R begin to draw tape from cassette, tension pole shall move to the left, thus loading will start. Confirm tension pole position at this stage.
3. When the tape (E-180) is near the beginning, confirm by eye that the center of tension pole is positioned 4.5~6.5mm to the left from center of Pl post.
4. Confirm that video tape is not curling at flange of Pl post or is not running on flanges.

● POSITIONING

1. In case tension pole is positioned to the left of center of Pl Post by less than 4.5mm, move tension band adjustment angle ① to direction of arrow B (Fig. 12-a), then screw ② shall be tightened.
2. In case tension pole is positioned on the left of center of Pl post by more than 6.5mm, move tension band adjustment angle ① to direction of arrow A (Fig. 12-b), then screw ② shall be tightened.

● NOTE

1. After completion of positioning, do not forget to fix the position with paint.
2. Do not overtighten screw, otherwise threads may be damaged.

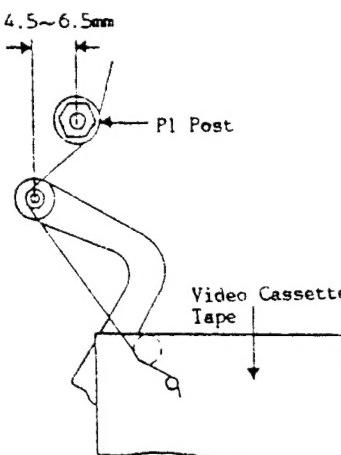


Fig. 12-a

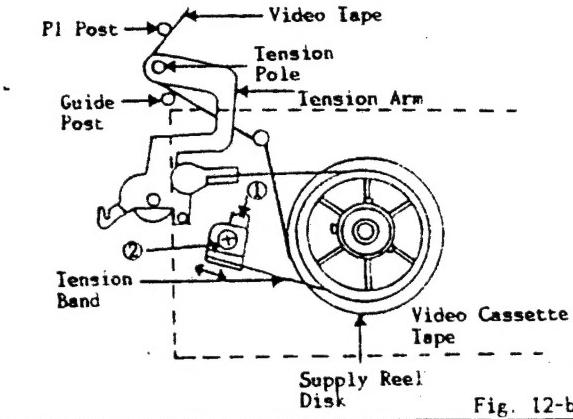


Fig. 12-b

■ A-13: NOT REQUIRED FOR THIS MODEL

■ A-14: CONFIRMATION AND ADJUSTMENT OF BACK TENSION OF RECORDING AND PLAYBACK

● CONFIRMATION

- When you use back tension measuring cassette.
 1. Set the measuring cassette tape.
 2. Set the unit in recording mode. At this time, confirm, by pointer of the measuring cassette tape, that back tension is within set-up points (20~50g.cm).
 3. Confirm video tape is tightly running on fixed guide.
 4. At beginning and ending of tape, confirm there is no sag or damage on edge of tape.

○ When you use tentelometer.

1. Set E-180 cassette tape to the beginning.
2. Set the unit in recording mode.
3. Pull Impedance roller toward arrow A as in Fig. 14-a and set tentelometer as in Fig. 14-a, 14-b confirming tape tension is within set-up points (23~30g).
4. Confirm video tape is running tight on Pl post.
5. Confirm there is no sag or damage on edge of tape both in beginning and ending of tape.

● ADJUSTMENT

1. In case tape tension is weaker than 23g, adjust tension plate on arrow A side of Fig. 14-c and re-confirm the tension.
2. In case tape tension is stronger than 30g, adjust tension plate on arrow B side of Fig. 14-c and re-confirm the tension.
(Use adjusting screwdriver, JG032)

● NOTE

1. The tentelometer should not touch F/E Head, drum or other component where tape may go over it.
2. When you use the back tension measuring cassette, it is recommended to also use tentelometer for proofreading.
3. Use lock paint after adjustment.
4. Do not overtighten screw, as threads may be damaged.

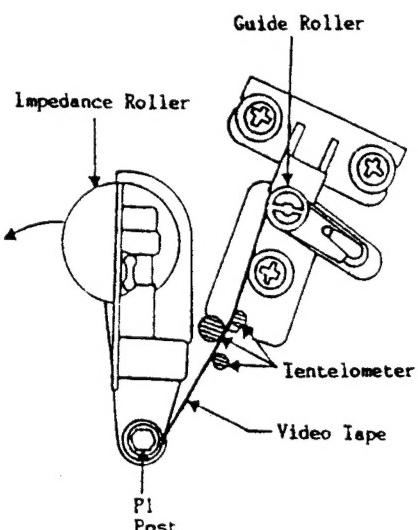


Fig. 14-a

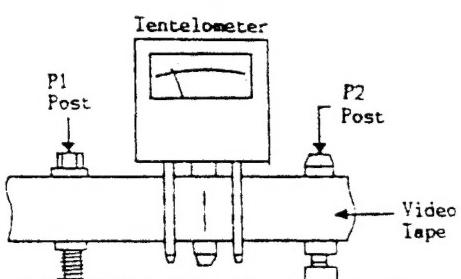


Fig. 14-b

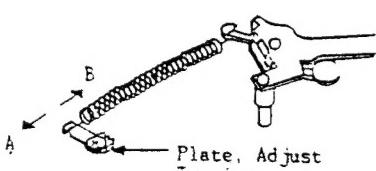


Fig. 14-c

■ A-15: CONFIRMATION OF REEL BRAKE TORQUE

■ A-15-1: Confirmation of take-up reel brake

● CONFIRMATION

1. Set the stop mode.
2. Set the torque gauge (JG002G) to the take-up reel and turn it counter-clockwise. Confirm that the brake torque is more than 250g.cm. Refer to Fig. 15-a.

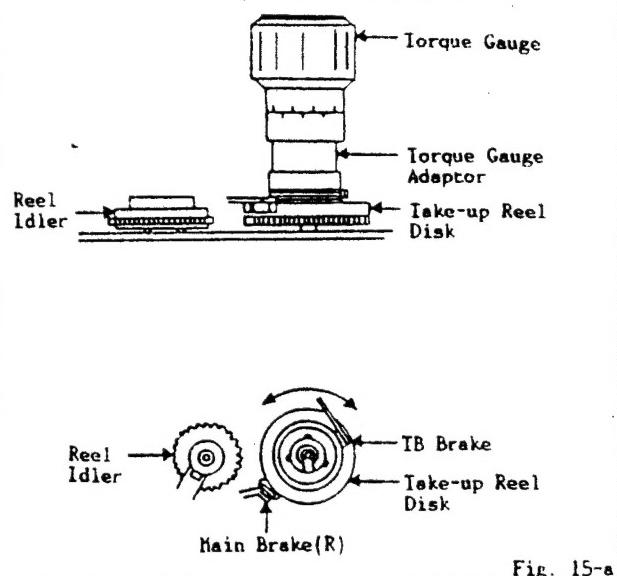


Fig. 15-a

■ A-15-2: Confirmation of supply reel brake

● CONFIRMATION

1. Set the stop mode.
2. Set the torque gauge (JG002G) to the supply reel and turn it clockwise. Confirm that the brake torque is more than 250g.cm. Refer to Fig. 15-b.

● NOTE

1. Separate the idler from the reel and confirm the brake torque.

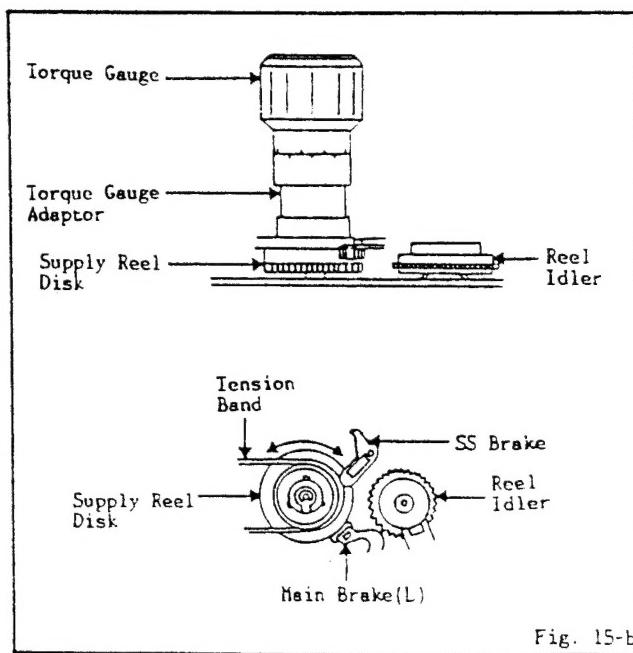


Fig. 15-b

■ A-16: CONFIRMATION AND ADJUSTMENT FOR THE HEIGHT OF P1 POST, P4 POST, LIMITER POST

● CONFIRMATION

1. Confirm that when tape is running there is no crease or bend on the tape edge at the places shown in Fig. 16-a.

■ A-16-1: Confirmation and adjustment for the height of P1 post

● ADJUSTMENT

1. Set the master plane (JG022) to the Deck.
2. Put the Post Adjustment Tip (JG026) on the master plane (JG022), adjust the height by sliding the 'A' part of Post Adjustment Tip (JG026) to the "a" direction of the master plane (JG022). Refer to Fig. 16-b, c.

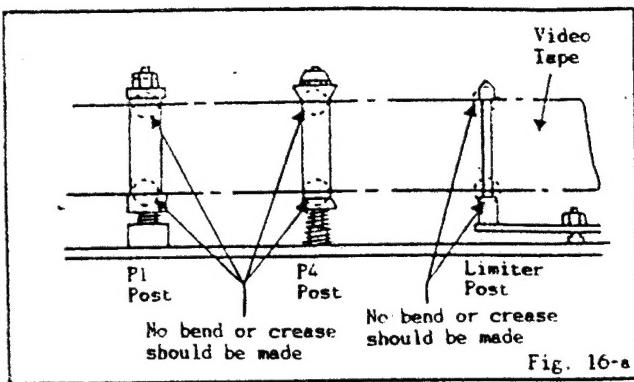


Fig. 16-a

■ A-16-2: Confirmation and adjustment for the height of P4 post.

● ADJUSTMENT

1. Set the master plane (JG022) to the Deck.
2. Put the Post Adjustment Tip (JG026) on the master plane (JG022), adjust the height by sliding the 'A' part of Post Adjustment Tip (JG026) to the "b" direction of the master plane (JG022). Refer to Fig. 16-b, c.

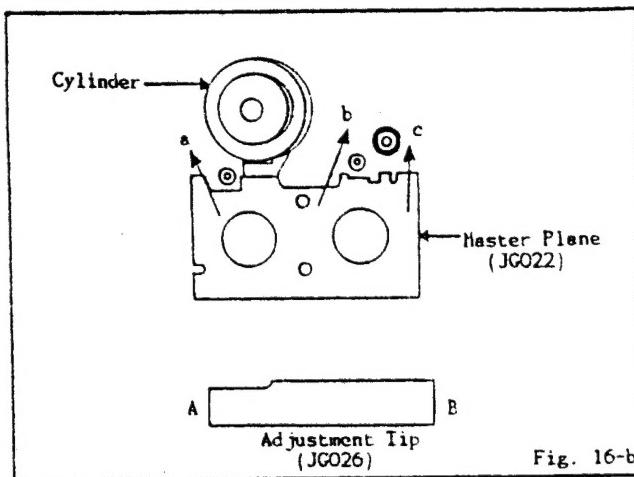


Fig. 16-b

■ A-16-3: Confirmation and adjustment for the height of limiter post

● ADJUSTMENT

1. Set the master plane (JG022) to the Deck.
2. Put the Post Adjustment Tip (JG026) on the master plane (JG022), adjust the height by sliding the 'A' part of Post Adjustment Tip (JG026) to the "c" direction of the master plane (JG022). Refer to Fig. 16-b, c.

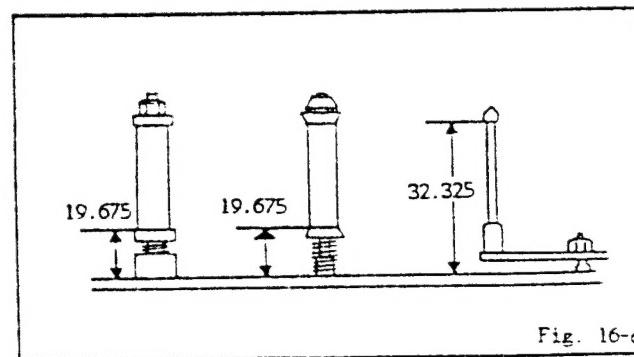


Fig. 16-c

● NOTE

1. The following adjustment must be carried out only when the height is not correct.
2. After adjustment, check it with a video tape running condition.
3. After completion of adjustment, carry out tape running adjustment. After adjusting the guide roller (L, R), check as shown in Fig. 16-a.
4. Do not move the nut after completion of adjustment.
5. After completing of adjustment, always fix P1 post and the guide roller with a screw lock.

■ A-17: REPLACEMENT OF A/C HEAD

● REPLACEMENT

1. Remove solder from lead wires placed on A/C Head P.C. Board, and take lead wires away from P.C. Board.
2. Loosen set screw ③ using (Fig. 17-a).
3. Remove screw ④ using plus(+) driver.
4. Remove A/C Head screw ⑤ using plus(+) driver. Carefully do this, because there is a spring between plate and A/C Head screw.

● NOTE

1. After completion of replacement, do not fail to carry out tape running adjustment. Do not touch head by any means when replacing A/C Head.

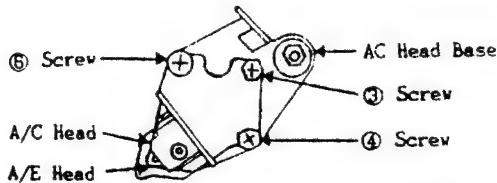


Fig. 17-a

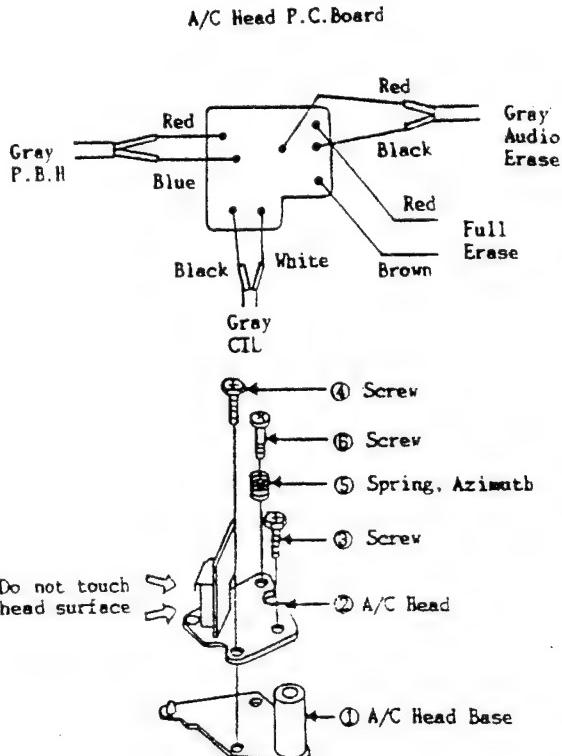


Fig. 17-b

■ A-18: CONFIRMATION AND ADJUSTMENT OF A/C HEAD HEIGHT AND TILT

● CONFIRMATION

- Set the unit in play mode using a E-180 tape.
- Confirm that tape is not curling on flange of guide post.
- Confirm that height and tilt of A/C Head against tape are as per Fig. 18.

● ADJUSTMENT

In case tape is running abnormally, make the following adjustments (Fig. 17-a and 18).

- Check tape running condition with the unit in play mode using the E-180 tape.
- Confirm tape runs smoothly without any crease or bend between guide post and guide roller R.
- It is absolutely impossible to get satisfactory sound if tape is distorted between A/C Head and guide post.
So confirm there is no crease on the tape.

- In case tape is not in good condition, adjust it by turning screw ③ slowly.

NOTE: Do not move guide post.

- Height of A/C Head against tape should be as per Fig. 18.

If a tape runs smoothly around A/C Head and rough adjustment of height is done, carry out the height and azimuth adjustment of A/C Head using linear tape (JG001).

- Play back audio tone 6KHz (picture is B/W Pattern) linear tape (JG001) and observe the waveform at Audio output terminal with oscilloscope.
- Turn SET SCREW ④ slowly until maximum level is achieved. When the level becomes maximum, SET SCREWS where level variation is the smallest. (Fig. 17-a)
- Re-check the tape running adjustment. (■A-19)

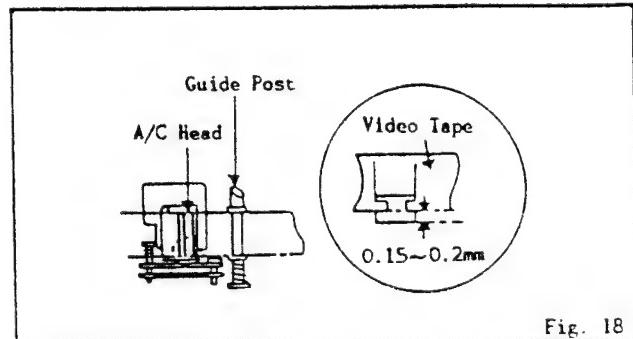


Fig. 18

■ A-19: ADJUSTMENT OF TAPE RUNNING

● ADJUSTMENT

- Carry out the reel disk height adjustment using master plane (JG022) and reel table height chip (JG024).
- Carry out the height confirmation and adjustment of P1 post and the guide post using fixed jig (JG029B) in accordance with paragraph ■A-16.
- In accordance with ■A-12 and ■A-13, carry out the positioning and confirm that the tension pole is with the tension pole positioning jig (JG029B).
- Play back the rough adjustment tape and make rough adjustment of guide roller height with the tool (JG021) according to ■A-21 and then, match lower edge of tape to drum lead and make sure that the video tape does not curl on flange of the guide post.
- In accordance with ■A-21, play the linear tape and adjust the guide roller height so that the envelope becomes flat and that flatness will not be affected even when the tracking control knob is turned.
- In accordance with ■A-18, adjust A/C Head height, tilt and azimuth.
- Position the tracking control knob at preset and turn adjusting nut X a little as in Fig. 17-a so that envelope becomes maximum. Adjust position of A/C Head.
- To confirm the flatness of envelope and voice recording, use the output from an appropriate test signal.
- After completion of adjustment, fix each adjustment screw and nut etc.

■ A-20: REPLACEMENT OF UPPER DRUM

● REPLACEMENT

1. Remove the 2 screws (Bind M3x6 ⑦, ⑧) held the Head Amp, then pull out the Head Amp from the cylinder.
2. Remove the screw ⑥ which held the EARTH BRUSH ⑤.
3. Disconnect the lead wires ① (two, yellow).
4. Disconnect the lead wire ② (one, red).
5. Disconnect the lead wire ③ (one, brown).
6. Remove the two holding screws with the flat washers ④ using plus(+) driver.
7. Pull out upper drum in such a way that it will not incline upward and carefully replace in order not to scratch disk.

● INSTALLATION

1. Set up a new drum as per Fig. 20 and correctly place each lead wire.
2. Set upper drum by two installing screws ④.
3. Solder lead wires ①, ② and ③ to their respective positions.
4. Install the EARTH BRUSH ⑤ by the screw ⑥.
5. Set the Head Amp with the 2 screws ⑦, ⑧ again.

● NOTE

1. Fitting clearance between the disk outer diameter and the drum inner diameter is made in micron order. Scratches and dust can make them hard to fit or to separate them and can adversely affect fitness of the drum and disk. Pay attention.
2. Do not touch the head on drum surface directly.
3. Do not apply excessive pressure to screwdriver.
4. Unless you have the tool (JG031), use gloves.
5. Connect to yellow, brown lead (CH-1) and red, yellow lead (CH-2).
6. Before installing, confirm that there is no scratch or dust on the disk front and surface.
7. Before installing, confirm that there are no scratches on the disk and upper drum assembly.
8. When setting, take care not to let any dust or dirt go into the clearance between disk and upper drum.
9. Turn holding screws slowly and carefully.
10. After completion of replacement, do not forget to carry out tape running adjustment and do the following electrical adjustment and confirmations.

- a. ■ E-4: P.G. Shifter Adjustment
- b. ■ E-6: Tracking Fix Adjustment
- c. ■ E-18: Playback Luminance Level Adjustment
- d. ■ A-21: Guide Roller Adjustment

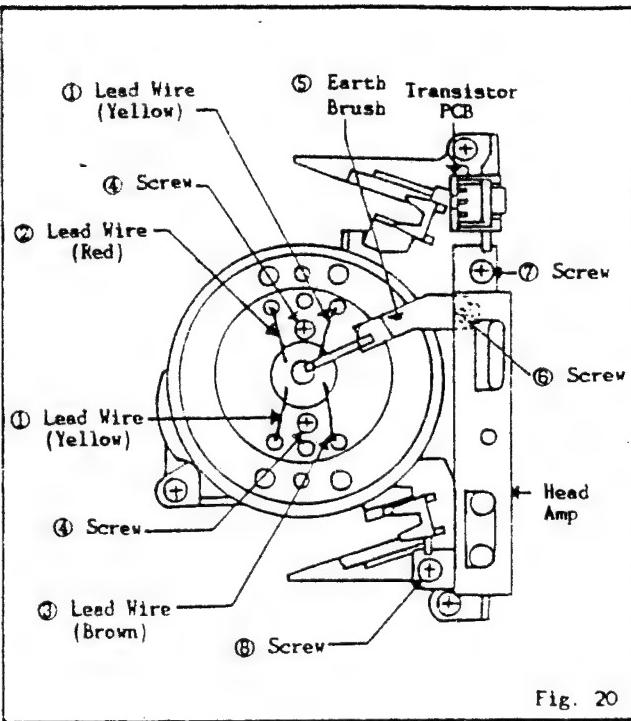


Fig. 20

■ A-21: ADJUSTMENT OF GUIDE ROLLER

● ADJUSTMENT

1. Insert a linear tape into stage.
2. Switch on main power and then connect monitor output cord and video input cord to proper positions.
3. Connect CH-1 and CH-2 of oscilloscope to envelope output and to the test point of switching pulse, respectively.
4. Carry out this adjustment in playback mode.
5. Trigger with SW pulse and observe the envelope. (Fig. 21-a)
6. Observe the envelope, adjust the guide roller height and let tape run on drum head.
If a video tape is running above or below helical lead position, waveform shall appear as in Fig. 21-b and 21-c.
7. Adjust the guide roller height while observing the envelope, and make the envelope flat. Adjust the envelope so that the flatness will not be affected even when the tracking control knob is turned.
8. When the tracking control knob is turned, adjust the envelope so that its A:B ratio is better than 10:7 at where the waveform starts to reduce at 'A'. (Fig. 21-d)
9. Make adjustment of ■ E-4 P.G. shifter point as per play SW point of electrical adjustment.
10. Record the color bar and playback, to confirm the envelope is flat.
11. After that, carry out confirmation of the envelope.

● NOTE

1. In case the guide roller has been adjusted, Re-adjust ● ADJUSTMENT in ■ A-18 again.

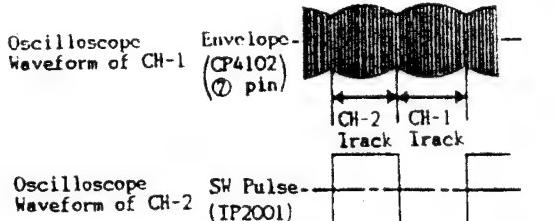


Fig. 21-a

a: Envelope waveform will appear like Fig. 21-b when a video tape is above the helical lead position.

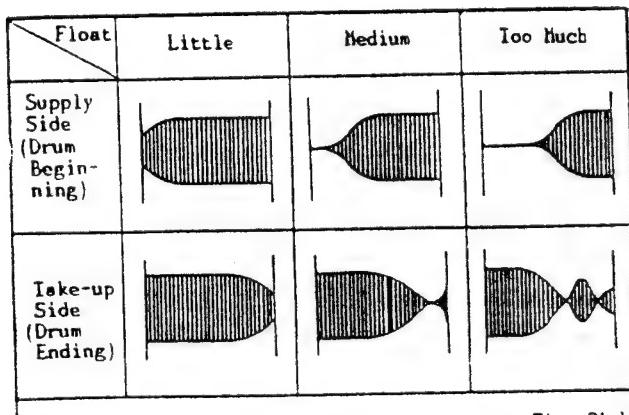


Fig. 21-b

b: Envelope waveform will appear like Fig. 21-c when a video tape is lower than helical lead position.

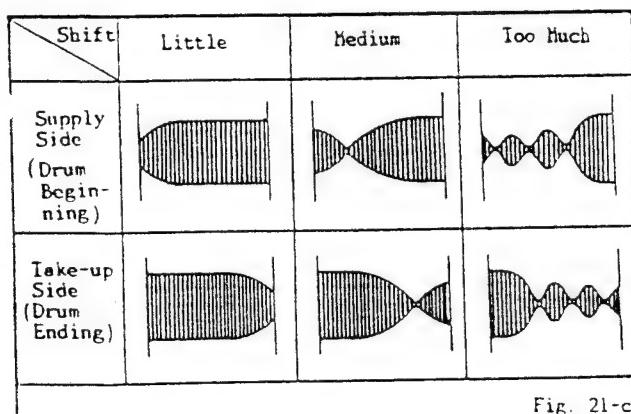


Fig. 21-c

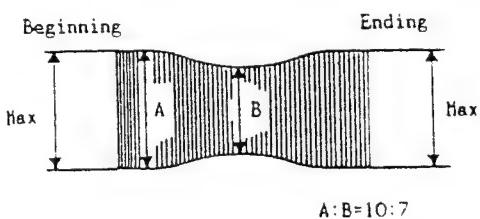


Fig. 21-d

■ A-22~25: NOT REQUIRED FOR THIS MODEL

■ A-26: REPLACEMENT OF CYLINDER UNIT

● REMOVAL

1. Remove the 2 screws (Bind M3x6 ③, ④) held the Head Amp, then pull out the Head Amp from the cylinder.
2. Remove the transistor PCB according to item ■ A-39.
3. Remove the video head shield plate in the video base plate to disconnect the video head lead connector.
4. Disconnect the connector on the cylinder base plate.
5. Disconnect the heater lead connector on the cylinder from the relay base plate.
6. Remove the cylinder unit by taking out the screws ① and ② . (Fig. 26)

● INSTALLATION

1. Install a new cylinder unit in reverse steps of REMOVAL.
2. Install the transistor PCB according to item ■ A-39.
3. Install the Head Amp with the 2 screws ③, ④ again.

● NOTE

1. Do not touch the surface of the cylinder head.
2. Make sure of ■ A-20.

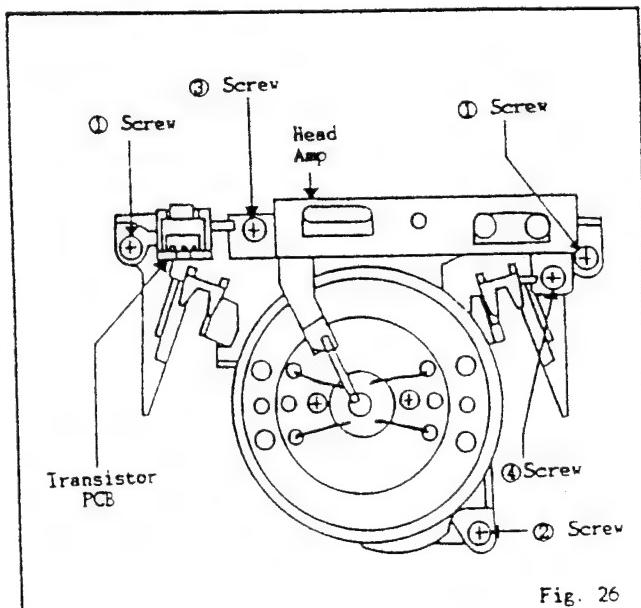


Fig. 26

■ A-27: REPLACEMENT OF TENSION BAND ASS'Y

● REMOVAL

1. Remove the screw ① held to the tension band.
2. Release the SS brake from the tension band to remove it from the Supply Reel Disk. (Fig. 27)
3. Remove the tension band from the tension arm.

● INSTALLATION

1. Install a new cylinder unit in reverse steps of REMOVAL.

● NOTE

1. The tension band should not be twisted while installing it.
2. Adjust the placement of the tension post according to item ■A-12.
3. After adjustment of the above 2 items, adjust it according to item ■A-14.

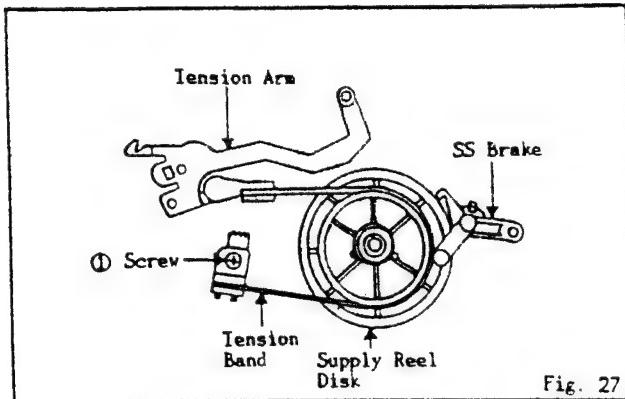


Fig. 27

■ A-28~33: NOT REQUIRED FOR THIS MODEL

■ A-34: REPLACEMENT OF LOADING BELT

● REMOVAL

1. Remove the screw ① held to the FS Gear Plate.
2. Remove the FS Gear Plate, the Polyslider Washer ② and the Fan Shaped Gear. (Fig. 34-a)
3. Remove the screw ③ held to the Loading Motor Band to take it off. (Fig. 34-b)
4. Remove the 2 pieces of stoppers ④, then pull the hook ⑤ in the direction of the arrow to remove the Loading Motor. (Fig. 34-b)
5. Remove the Loading Belt from the Loading Motor.
6. Move the Tension Lever 1 to the dotted line. (Fig. 34-a)
7. Remove the Main Cam.
8. Remove the Worm Ass'y and replace Loading Belt with new one.

● INSTALLATION

1. Hang a new Loading Belt on the pulley of the Worm Ass'y, then hang it on the pulley of the Loading Motor.
2. First, attach the Loading Motor, next fix the Worm Ass'y.
3. Install the Main Cam.
4. Install the Tension Lever 1.
5. Install the Fan Shaped Gear.
6. Install the FS Gear Plate, then hold the screw ①.
7. Install the Loading Motor Band with the screw ②.

● NOTE

1. Clean the pulley when replacing Loading Belt.
2. Exchange it in stop mode.
3. Avoid sticking grease to the Loading Belt.
4. Do not mistake the point (A, D, E) of the Main Cam, the Tension Lever 1 and the Fan Shaped Gear. (Fig. 34-a, b, c)
5. Make sure that A point is within B range in holding of the Main Cam. (Fig. 34-c)
6. Make sure that D part is within C part in holding of the Tension Lever 1. (Fig. 34-a, c)
7. Make sure that E part is within C part in holding of the Fan Shaped Gear. (Fig. 34-a, c)

● CHECK AFTER INSTALLATION

1. Check if strange sound is made in play mode.
2. Check if P2 post and P3 post are fitted to the post stopper.
3. Check if P2 post and P3 post are completely returned in stop mode.

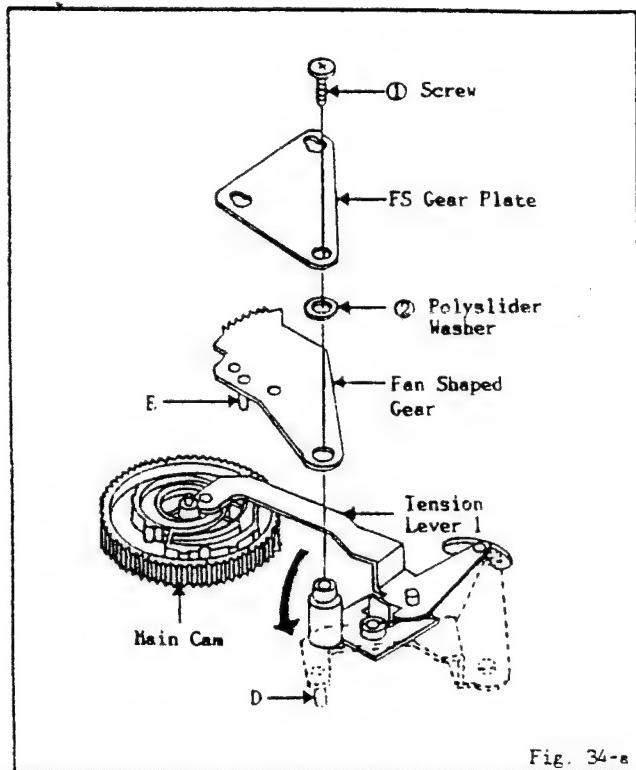


Fig. 34-a

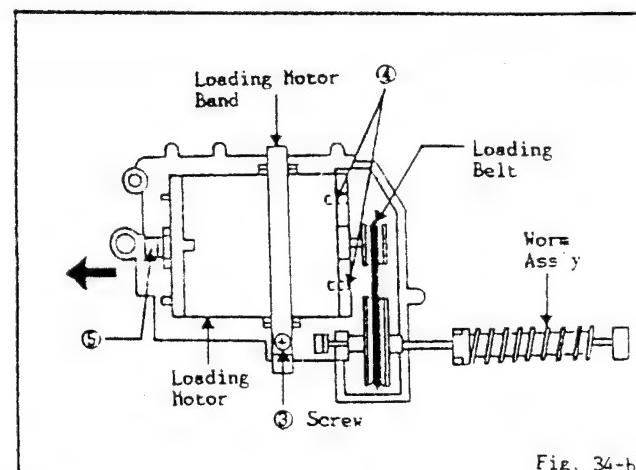


Fig. 34-b

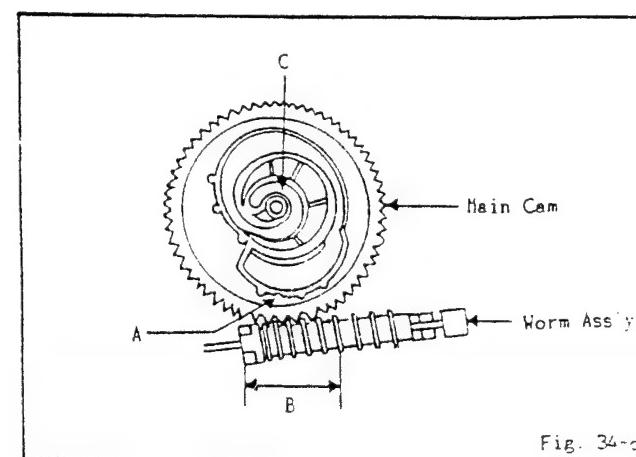


Fig. 34-c

■ A-35: NOT REQUIRED FOR THIS MODEL

■ A-36: REPLACEMENT OF PINCH ROLLER

● REMOVAL

1. Remove the screw ①. (Fig. 36)
2. Remove the Pinch Roller.

● INSTALLATION

1. Install a new Pinch Roller in reverse order of REMOVAL.

● NOTE

1. Be careful of bending the Pinch Roller Arm in removal and installation.
2. Do not touch around the Pinch Roller.

● CHECK AFTER INSTALLATION

1. Check if the tape is running normally in PLAY mode.

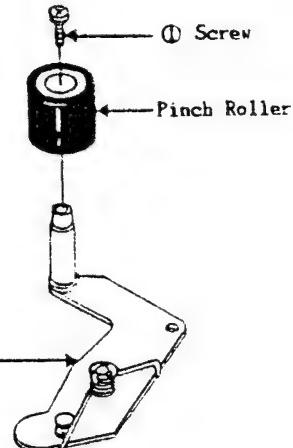


Fig. 36

■ A-37: REPLACEMENT OF DD UNIT

● REMOVAL

1. Remove the Deck unit from the Inside Cabinet.
2. Remove the 3 screws ① (SEMS A 2.6x6) held to DD unit on front of the Deck. (Fig. 37)
3. Turn the Deck over, then remove the Reel Belt from the clutch pulley.
4. Remove the screw ⑤ (IAP TITE(S) BIND 3x6) held to the DD unit PCB. (Fig. 35)
5. Remove the DD unit slowly from rear side of the Deck.

● INSTALLATION

1. Return the Limiter Post to the dotted line, then fit new DD unit to the chassis without touching center of the shaft of the DD unit to the chassis. And return the Limiter Post to where it was. (Fig. 37)
2. Install the screw ⑤ (IAP TITE(S) BIND 3x6) held to the DD unit PCB. (Fig. 35)
3. Install the clutch pulley without twisting the Reel Belt.

● NOTE

1. Do not bend the Limiter Post.
2. Use the specified screw held to the DD unit.
3. Tighten the screws completely.

● CHECK AFTER INSTALLATION

1. Check if tape running is normal in PLAY mode.
2. Check if FF/REW mode works normally.

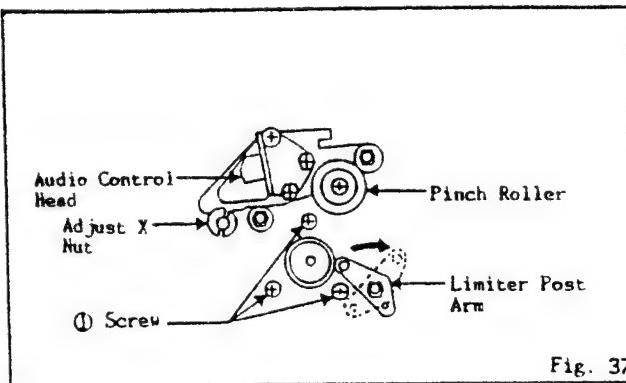


Fig. 37

■ A-38: REPLACEMENT OF LOADING MOTOR

● REMOVAL

1. Remove the screw ③ held to the Loading Motor Band.
2. Remove the 2 stoppers ④, then pull the hook ⑤ in the direction of the arrow to take off the Loading Motor. (Fig. 34-b)
3. Remove the Loading Belt from the Loading Motor.

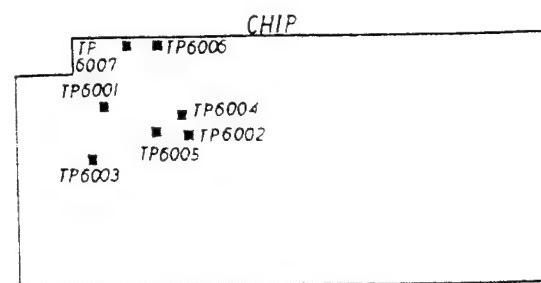
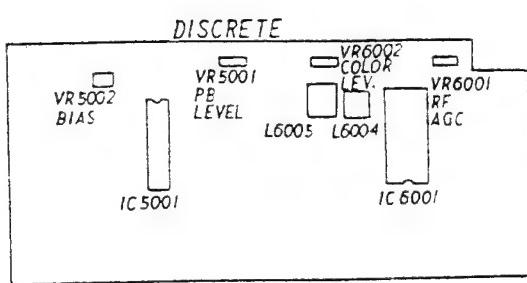
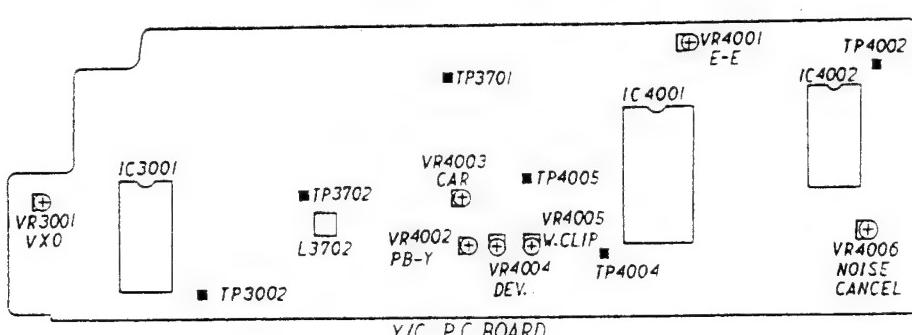
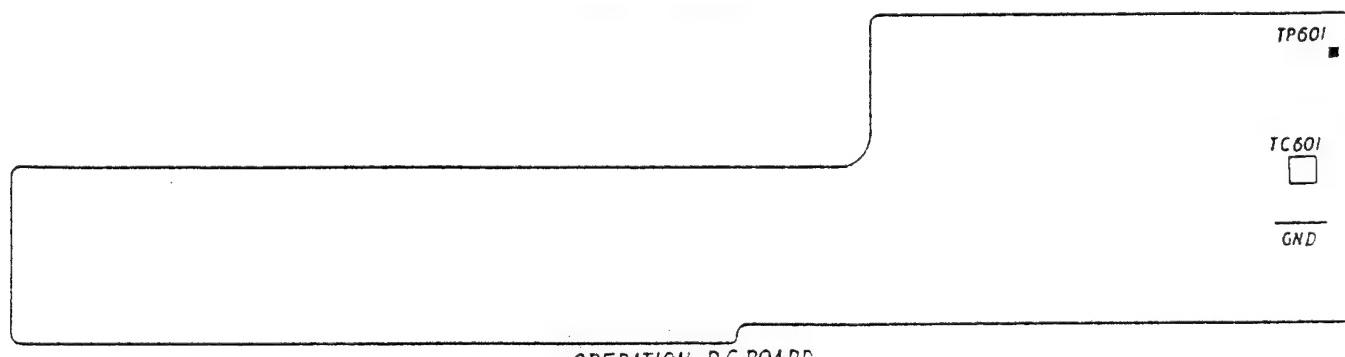
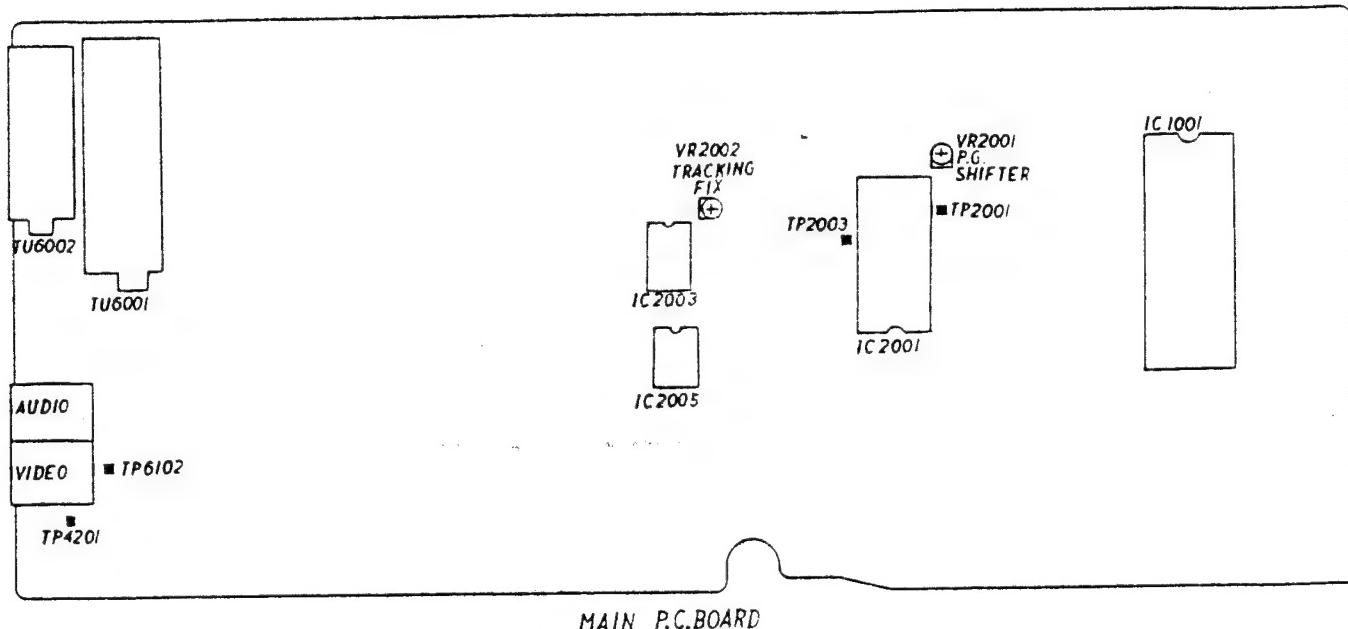
● INSTALLATION

1. Install new Loading Motor in reverse steps of REMOVAL.

● NOTE

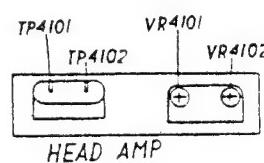
1. Make sure to wire the lead.

MAJOR COMPONENTS LOCATION GUIDE



AUDIO/VIF P.C.BORD

AUDIO/VIF P.C.BORD



■ A-39: REPLACEMENT OF TRANSISTOR PCB AND TRANSISTOR SPRING

● REMOVAL

1. Insert a small minus(-) driver into the transistor spring as shown in Fig. 39-a.
2. Hold both the edges of transistor PCB (Ⓐ part) with your fingers and pull out the transistor PCB while turning the driver.

● INSTALLATION

1. Set the transistor spring in the place marked as shown in Fig. 39-b.
2. Fit the transistor PCB as shown in Fig. 39-b.

● NOTE

1. The unit should be unplugged from the AC outlet.
2. Do not scratch or mar the cylinder.
3. Be careful not to split the transistor PCB.
4. If the transistor spring is broken when holding or removing the transistor PCB, replace new one.

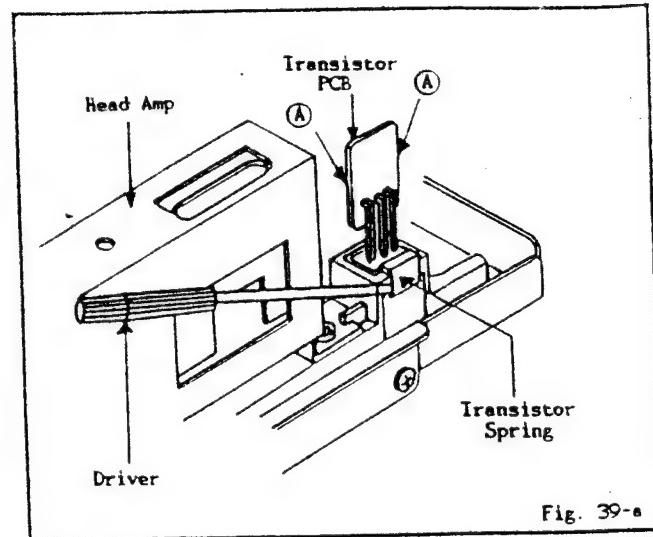


Fig. 39-a

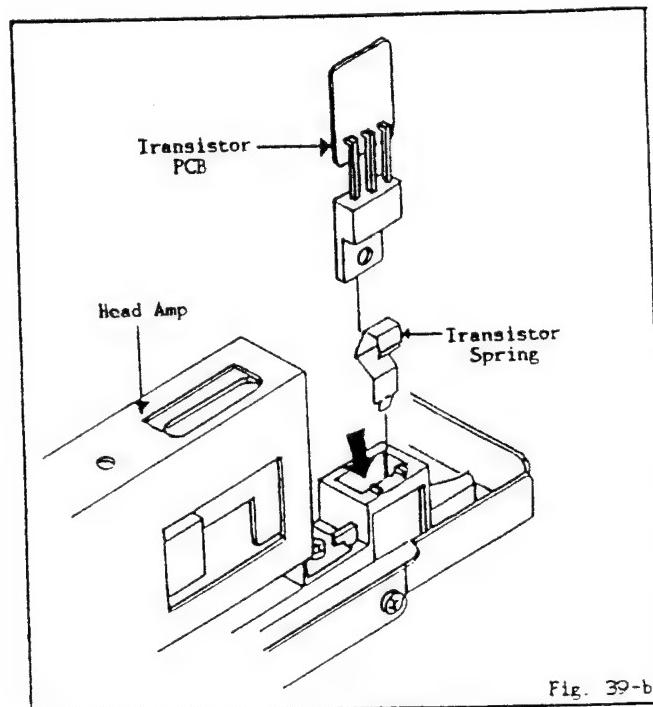


Fig. 39-b

ELECTRICAL ADJUSTMENT

Remove the following parts before operating electric adjustment.

1. Top Cabinet (2 screws)
2. Bottom Plate (5 screws)

After adjustment reassemble the unit in reverse order.

Prepare the following measurement tools for the electrical adjustment.

1. Oscilloscope (2 channel type)
2. AC Voltmeter
3. Quartz Timer
4. Sweep-Marker Generator
5. AFT Adjustment Oscillator
6. Synchro Scope
7. VIF Unit
8. Voltmeter
9. Frequency Counter
10. SIF Unit
11. Spectrum Analyzer
12. DC Supplier

ADJUSTMENT PROCEDURE

■ E-1~3: NOT REQUIRED FOR THIS MODEL

■ E-4: P.G. SHIFTER ADJUSTMENT

CONDITIONS

MODE - PLAYBACK

Input signal - Standard tape

NOTE: Tracking control should be set at click point.

INSTRUCTIONS

- (1) Connect CH-1 on the oscilloscope to TP2001 and connect CH-2 on the oscilloscope to TP4201.
- (2) Adjust VR2001 so that the waveform of the oscilloscope may become $6.5 \pm 0.5\text{H}$ at both leading and trailing edges as shown in Fig. 4-a, b.

CHART/CHARACTERISTICS

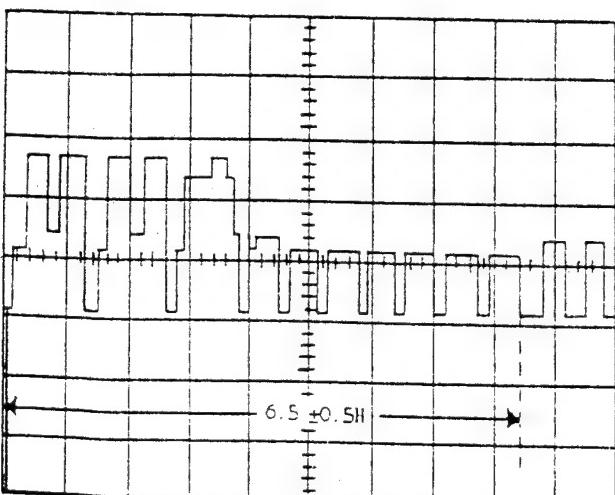


Fig. 4-a

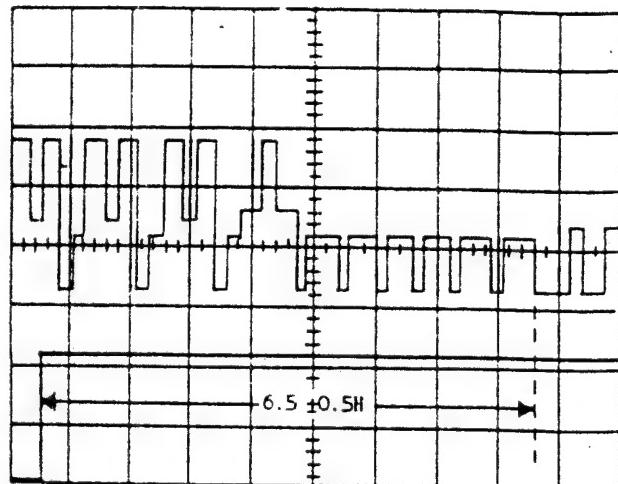


Fig. 4-b

■ E-5: NOT REQUIRED FOR THIS MODEL

■ E-6: TRACKING FIX ADJUSTMENT

CONDITIONS

MODE - PLAYBACK

Input signal - Standard tape

NOTE: Tracking control should be set at click point.

INSTRUCTIONS

- (1) Connect CH-1 on the oscilloscope to TP2001 and connect CH-2 on the oscilloscope to TP2003.
- (2) Playback the recorded portion and adjust VR2002 so that "T" portion may become $2.6 \pm 0.05\text{V}$ as shown in Fig. 6.

CHART/CHARACTERISTICS

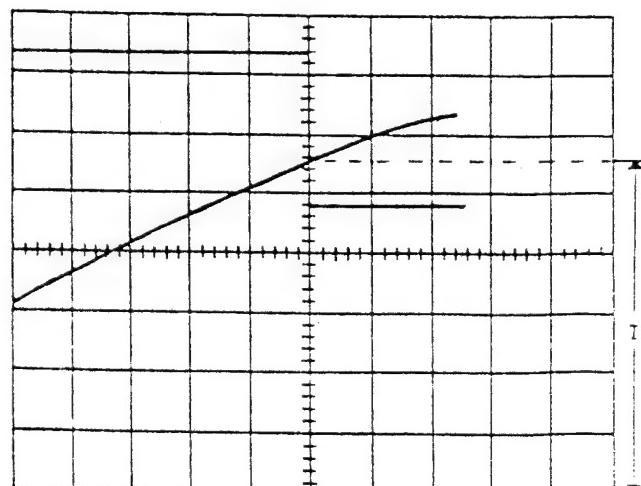


Fig. 6

■ E-7~11: NOT REQUIRED FOR THIS MODEL

■ E-12: E-E LEVEL ADJUSTMENT

CONDITIONS

MODE - STOP

Input signal - Color bar

NOTE: Video out of the unit should be terminated with 75 ohm load.

INSTRUCTIONS

- (1) Connect the oscilloscope to TP4201.
- (2) Adjust VR4001 so that waveform may become $1.0 \pm 0.05V_{pp}$ as shown in Fig. 12.

CHART/CHARACTERISTICS

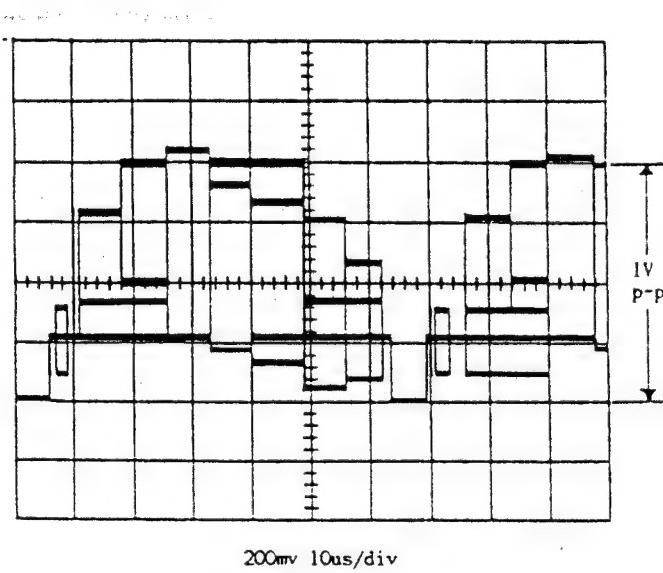


Fig. 12

■ E-13: NOT REQUIRED FOR THIS MODEL

■ E-14: VXO FREQUENCY ADJUSTMENT

CONDITIONS

MODE - PLAYBACK

Input signal - Color bar test tape

NOTE: Use high impedance probe for the input of counter. Proportion should be 10:1 when using the oscilloscope probe.

INSTRUCTIONS

- (1) Connect the frequency counter to TP3002.
- (2) Playback the test tape and adjust VR3001 to make $4.433619 \pm 10\text{kHz}$ as shown in Fig. 14.

■ E-15: WHITE CLIP ADJUSTMENT

CONDITIONS

MODE - RECORD

Input signal - Color bar

INSTRUCTIONS

- (1) Connect CH-1 on the oscilloscope to TP4201 and connect CH-2 on the oscilloscope to TP4005.
- (2) Adjust VR4005 so that waveform become as shown in Fig. 15.

VR4005 - White Clip ($185 \pm 5\%$)

CHART/CHARACTERISTICS

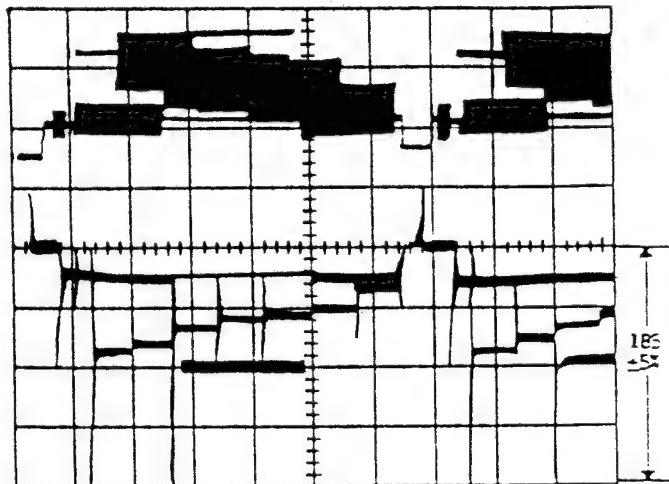


Fig. 15

■ E-16: CARRIER AND DEVIATION ADJUSTMENT

CONDITIONS

MODE - RECORD

Input signal - Color bar

INSTRUCTIONS

- (1) Connect TP4004 to the input terminal on the spectrum analyzer, then adjust 3.8MHz and 4.8MHz as shown in Fig. 16 with VR4002 and VR4003.

VR4004 (Deviation)
VR4003 (FM Carrier)

CHART/CHARACTERISTICS

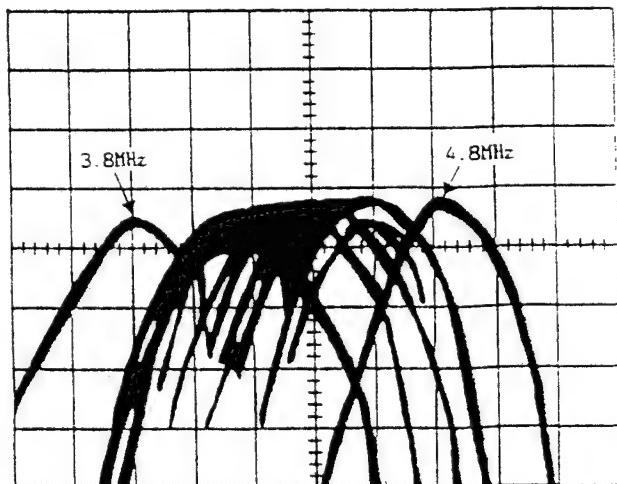


Fig. 16

E-17: RECORD CURRENT ADJUSTMENT

CONDITIONS

MODE - RECORD

Input signal - Color bar

INSTRUCTIONS

- (1) Connect CH-1 of the oscilloscope to TP4101 and CH-2 to TP4201. Reduce brightness signal factors by turning VR4102 fully counter-clockwise.
- (2) Adjust VR4101 so that the cyan level may become $30 \pm 2\text{mVp-p}$ as shown in Fig. 17-a.
- (3) Adjust VR4102 so that the horizontal sync. level may become $160 \pm 5\text{mVp-p}$, as shown in Fig. 17-b.

CHART/CHARACTERISTICS

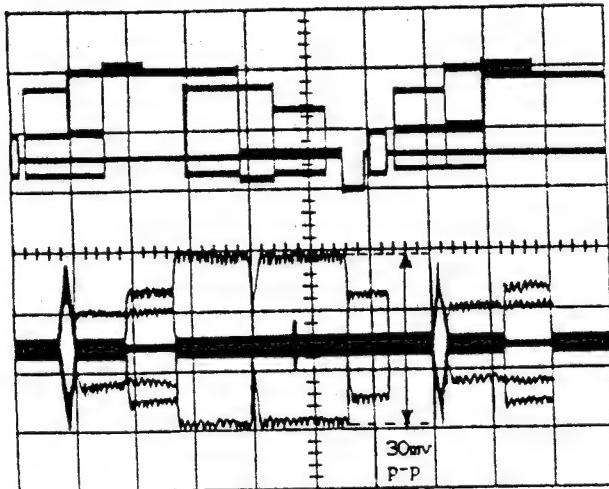


Fig. 17-a

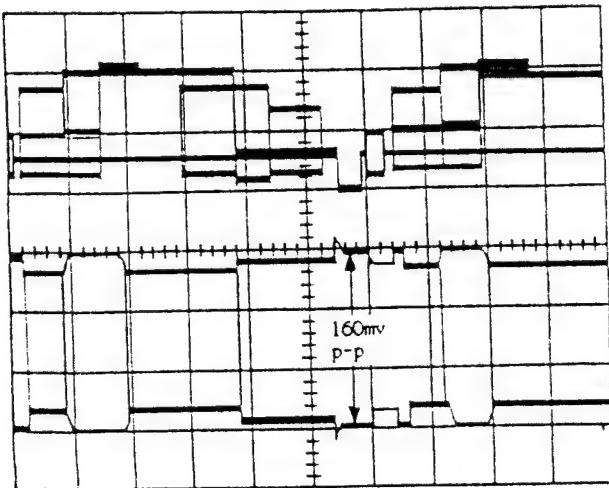


Fig. 17-b

E-18: PLAYBACK LUMINANCE LEVEL ADJUSTMENT

CONDITIONS

MODE - PLAYBACK

Input signal - Color bar test tape

NOTE: The above adjustment values are measured with the video output jack terminated with 75 ohm resistor.

INSTRUCTIONS

- (1) Connect oscilloscope to TP4201.
- (2) Adjust VR4002 so that the signal may become $1.0 \pm 0.05\text{Vp-p}$.

CHART/CHARACTERISTICS

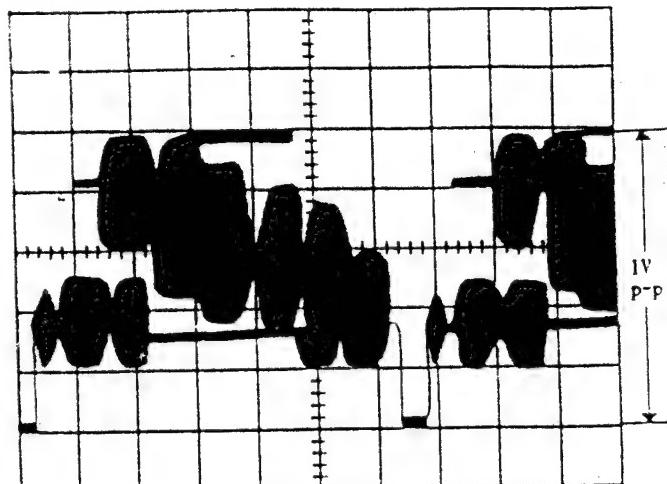


Fig. 18

E-19: AUDIO BIAS CURRENT ADJUSTMENT

CONDITIONS

MODE - RECORD

Input signal - No signal

INSTRUCTIONS

- (1) Remove the shield plate.
- (2) Connect the AC voltmeter to the arrow point, then adjust the voltage to $3.3 \pm 0.1\text{mVrms}$ with VR5002.
- (3) After adjustment, lift up the shield plate.

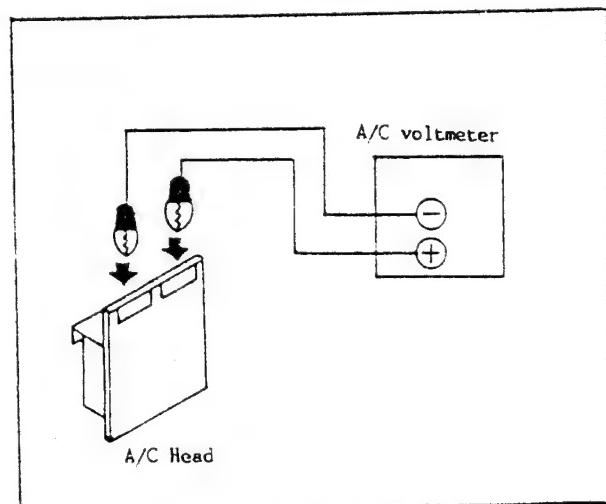


Fig. 19

E-20: AUDIO PLAYBACK LEVEL ADJUSTMENT

CONDITIONS

MODE - Self(RECORD and PLAYBACK)
Input signal - 1KHz 300Vrms, Audio signal
Color bar, Video signal.

INSTRUCTIONS

- (1) Connect the AC voltmeter to audio out jack, which is terminated with 47K ohm resistor.
- (2) Record and then playback the audio signal as specified.
- (3) Adjust VR5001 so that the playback output may become $390 \pm 10, -20\text{mVrms}$.

- E-21~27: NOT REQUIRED FOR THIS MODEL
- E-28: SECAM IDENTIFICATION ADJUSTMENT

CONDITION

MODE - RECORD

Input signal - (SECAM) Video RF
SECAM signal

SECAM Input Level 35dB
SECAM Input Level 37dB

INSTRUCTIONS

- (1) Connect CH-1 of oscilloscope to TP4201 and CH-2 of oscilloscope to TP3702.
- (2) Adjust L3702 so that peak of waveform A and leading edge of video signal of waveform B may become same as shown in Fig. 28.

CHART/CHARACTERISTICS

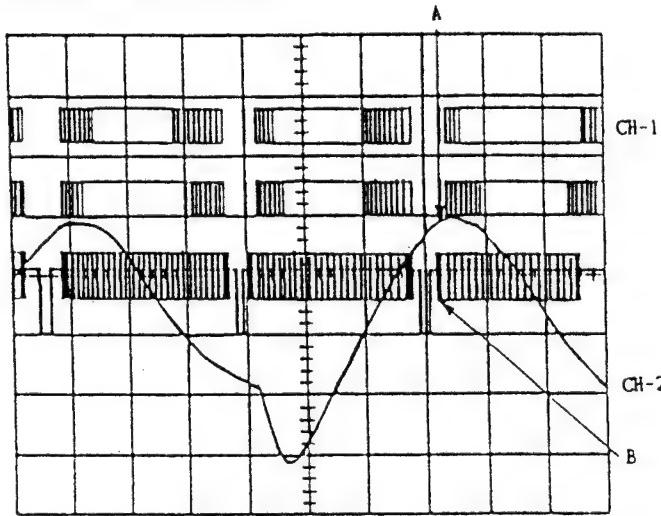


Fig. 28

- E-29~57: NOT REQUIRED FOR THIS MODEL
- E-58: NOISE CANCEL ADJUSTMENT

CONDITION

MODE - PLAYBACK

Input signal - Color bar test tape

NOTE: The above adjustment Values are measured with the video output jack terminated with 75 ohm resistor.

INSTRUCTIONS

- (1) Connect CH-1 of the oscilloscope to TP4002 and CH-2 to TP4201.
- (2) Adjust the VR4006 so that the waveform of CH-1 is straight as shown in Fig. 58.

CHART/CHARACTERISTICS

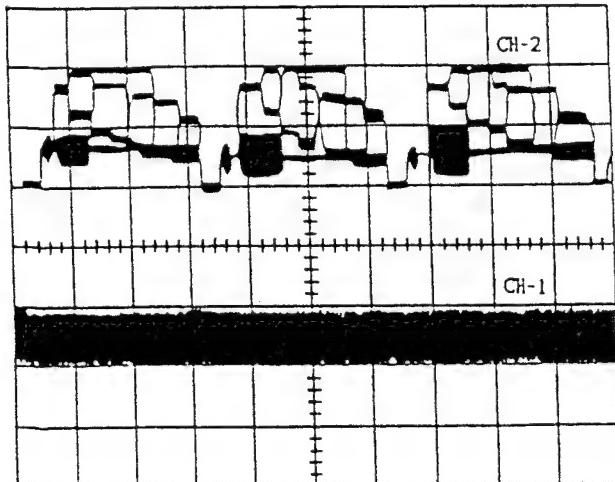


Fig. 58

- E-59, E-60: NOT REQUIRED FOR THIS MODEL

E-61: VIDEO IF ADJUSTMENT

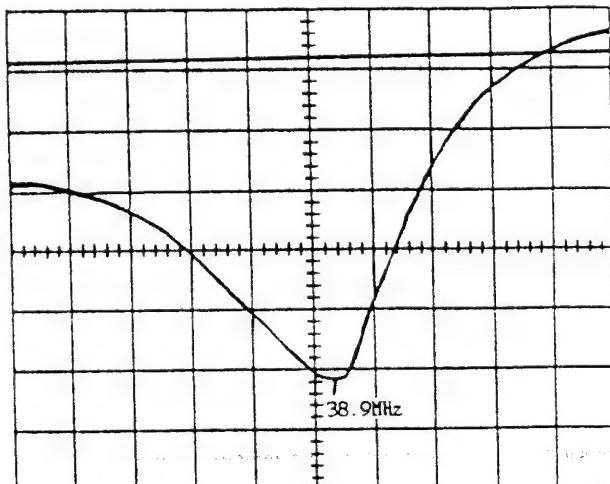
INSTRUCTIONS

- (1) Supply 12V with the DC Supplier.
- (2) Terminate TP6004 and TP6005 to 100 ohm.



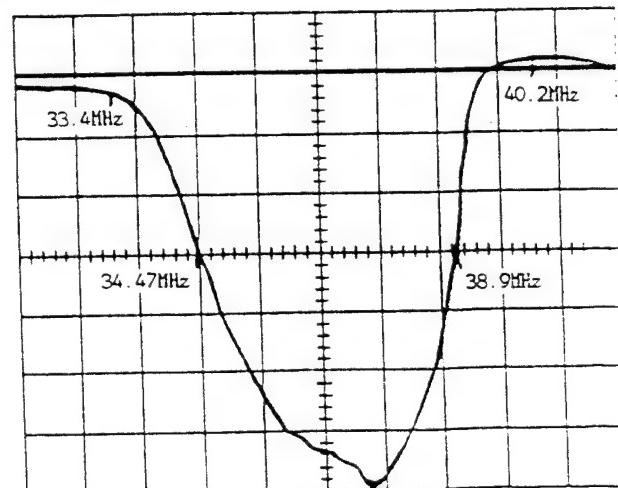
- (3) Connect the output of Sweep-Marker Generator to TP6001.
- (4) Adjust L6004 so that output waveform of TP6002 may become as shown in Fig. 61-a.
- (5) Connect the output of Sweep-Marker Generator to the Tuner Pack TP.
- (6) Make sure that the output of waveform of TP6002 is as shown in Fig. 61-b.

CHART/CHARACTERISTICS



Single peak waveform

Fig. 61-a

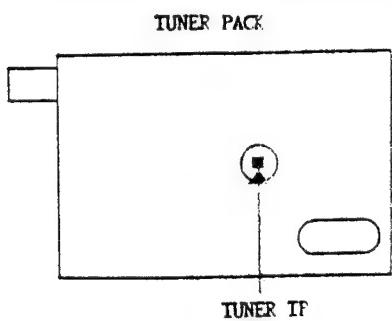


Over all waveform

Fig. 61-b

■ E-62: AFT ADJUSTMENT

NOTE: Before adjustment, connect the 2.2K ohm resistor between the Tuner Pack TP and the AFT adjustment oscillator(38.9MHz).



INSTRUCTIONS

- (1) Connect the output of the AFT adjustment oscillator to the Tuner Pack TP.
- (2) Connect TP6006 to the Voltmeter and adjust L6005 so that the voltage in the AFT switch ON mode is equal to the AFT switch OFF mode.

■ E-63: NOT REQUIRED FOR THIS MODEL

■ E-64: RF AGC ADJUSTMENT

CONDITIONS

MODE - STOP
AFT SW - ON

INSTRUCTIONS

- (1) Receive the signal of Monochrome Pattern.
- (2) Connect the DC Voltmeter to TP6007.
- (3) Set the RF input to 80dB.
- (4) Adjust VR6001 so that the voltage is equal to $2.7 \pm 0.1V$.

■ E-65: COLOR LEVEL ADJUSTMENT

CONDITIONS

MODE - STOP
AFT SW - ON

INSTRUCTIONS

- (1) Receive the signal of color bar.
- (2) Connect the oscilloscope to TP6102.
- (3) Adjust VR6002 so that the magenta level is $45 \pm 5\%$ when Y-level is 1Vp-p.

CHART/CHARACTERISTICS

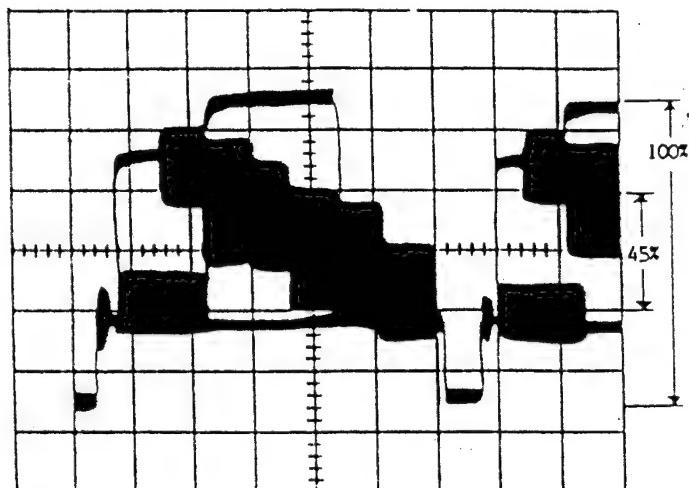


Fig. 65

■ E-66: CLOCK ADJUSTMENT

CONDITIONS

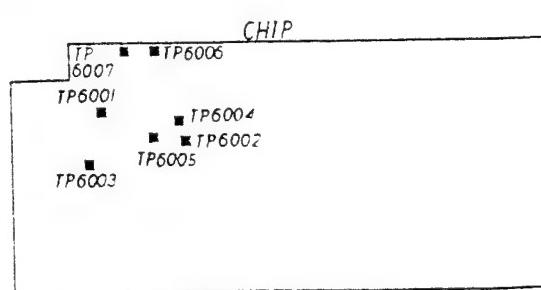
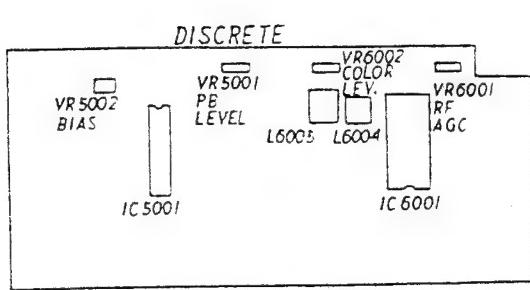
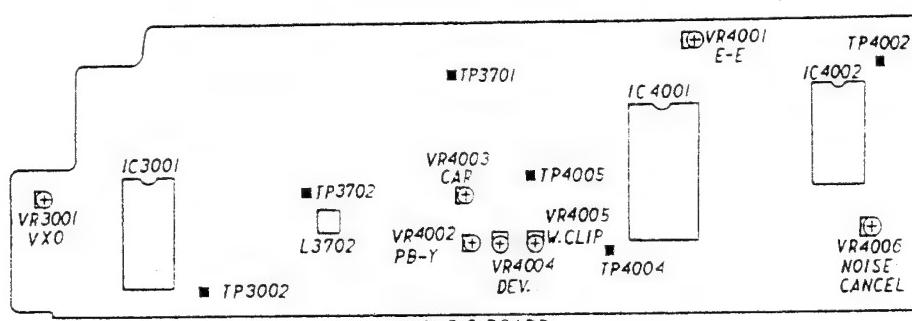
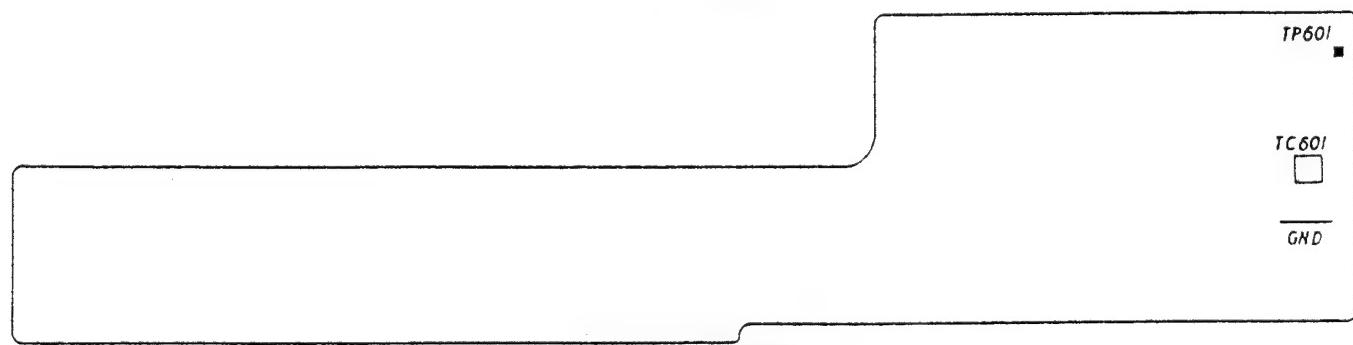
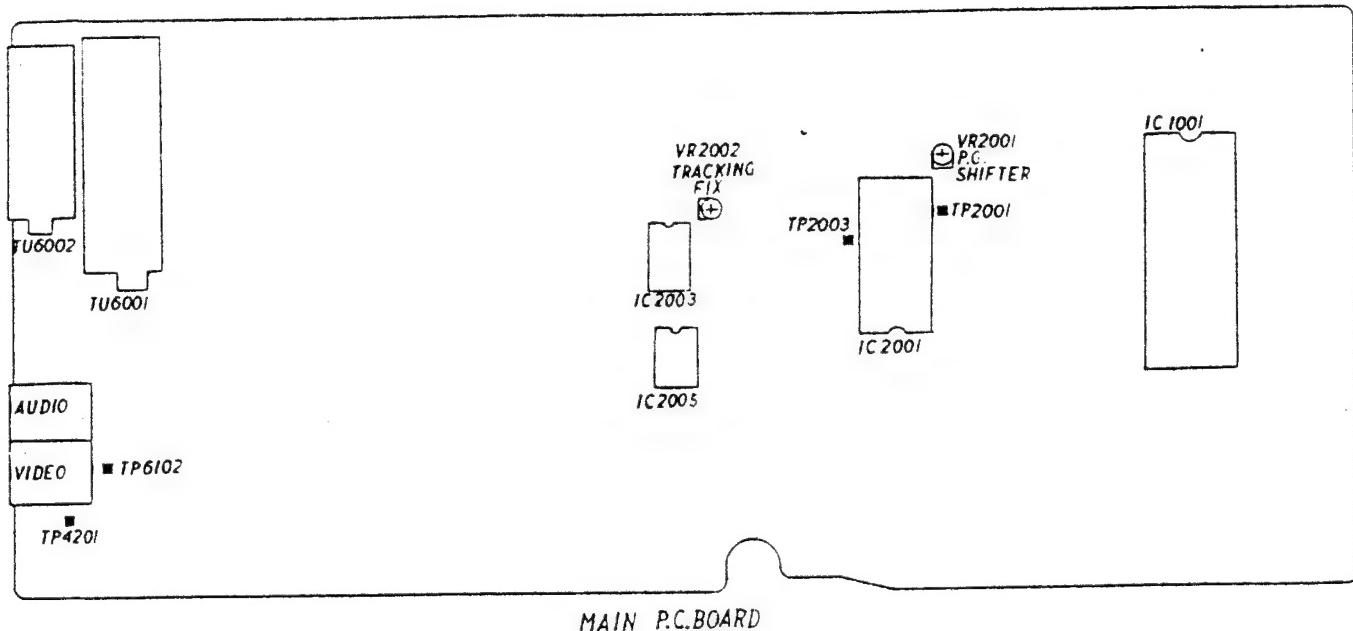
MODE - STOP
POWER ON
CLOCK SET

NOTE: Quartz timer should be supplied with the power more than 30 minutes before the adjustment.

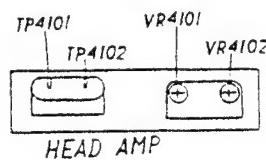
INSTRUCTIONS

- (1) Connect the Quartz timer to TP601.
- (2) Adjust TC601 so that day difference is within 0.15 sec.

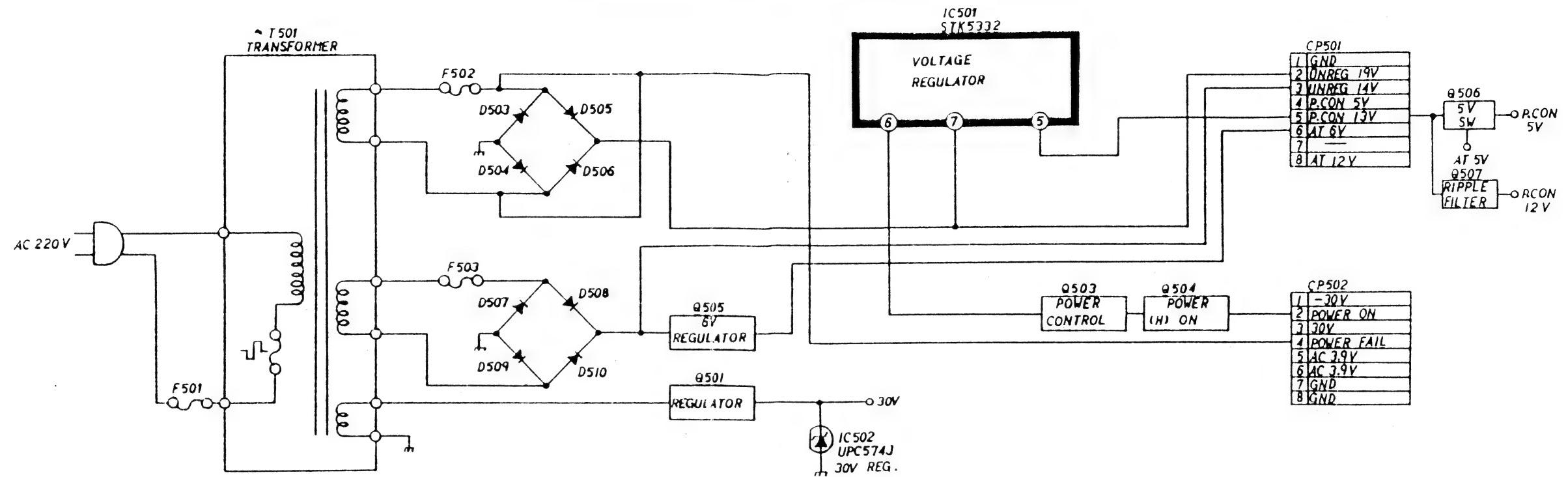
MAJOR COMPONENTS LOCATION GUIDE



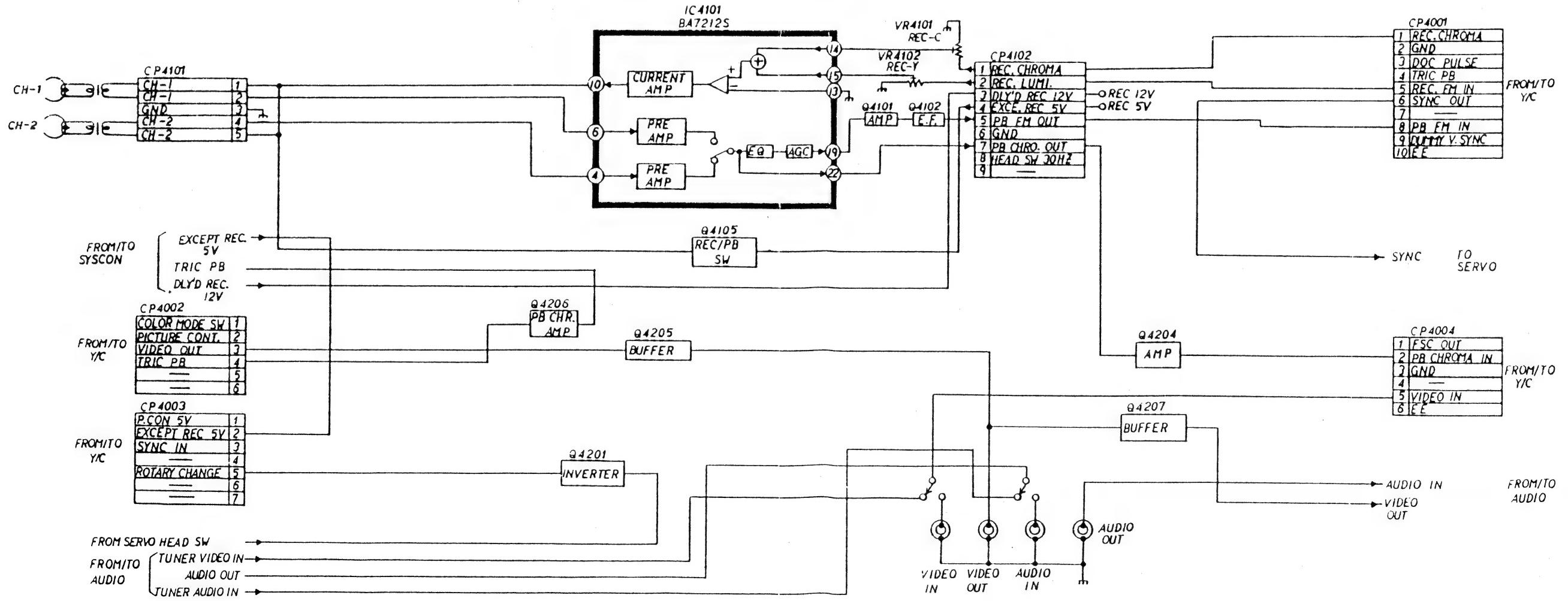
AUDIO/VIF P.C.BORD



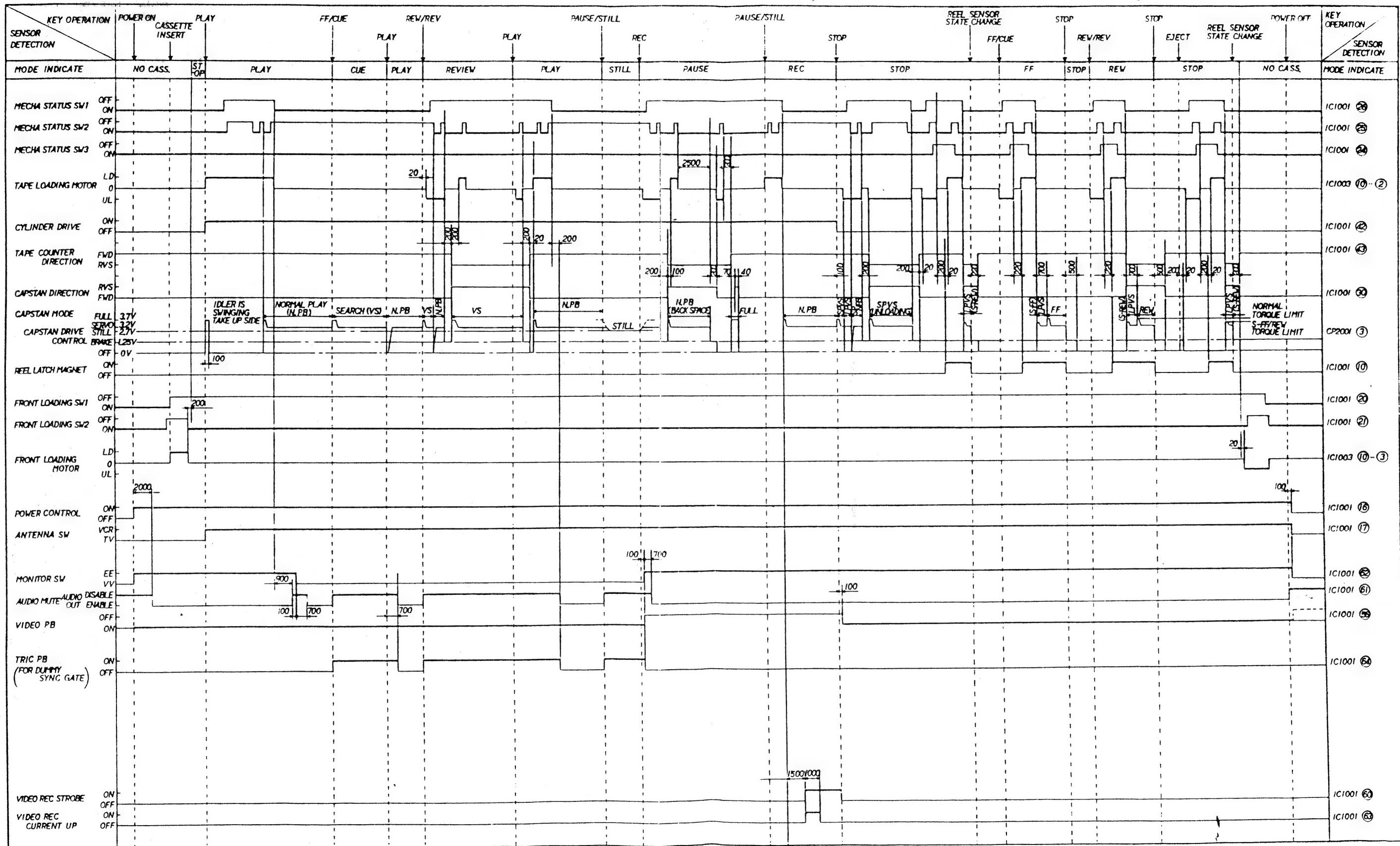
POWER SUPPLY BLOCK DIAGRAM



HEAD AMP BLOCK DIAGRAM

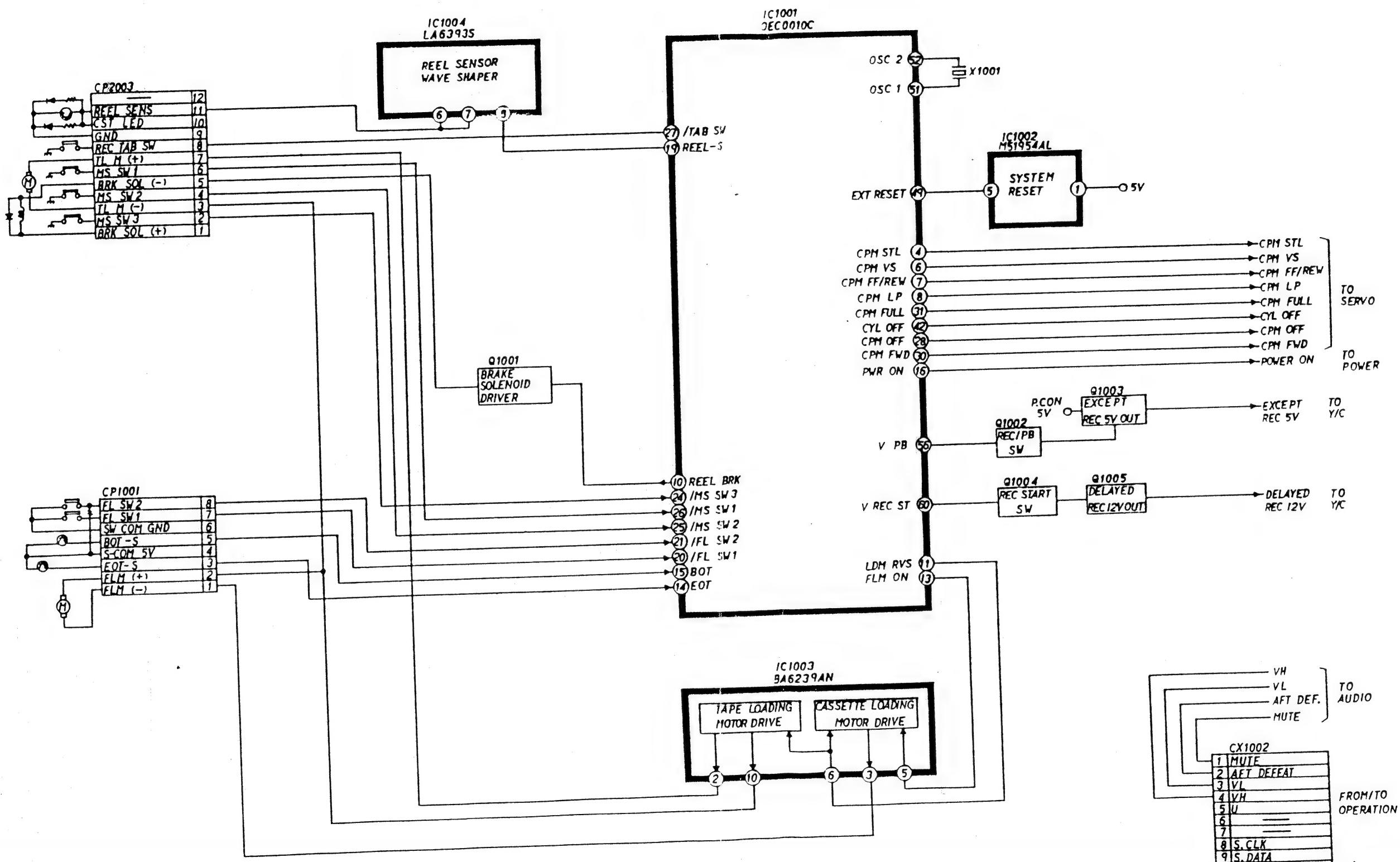


TIMING CHART



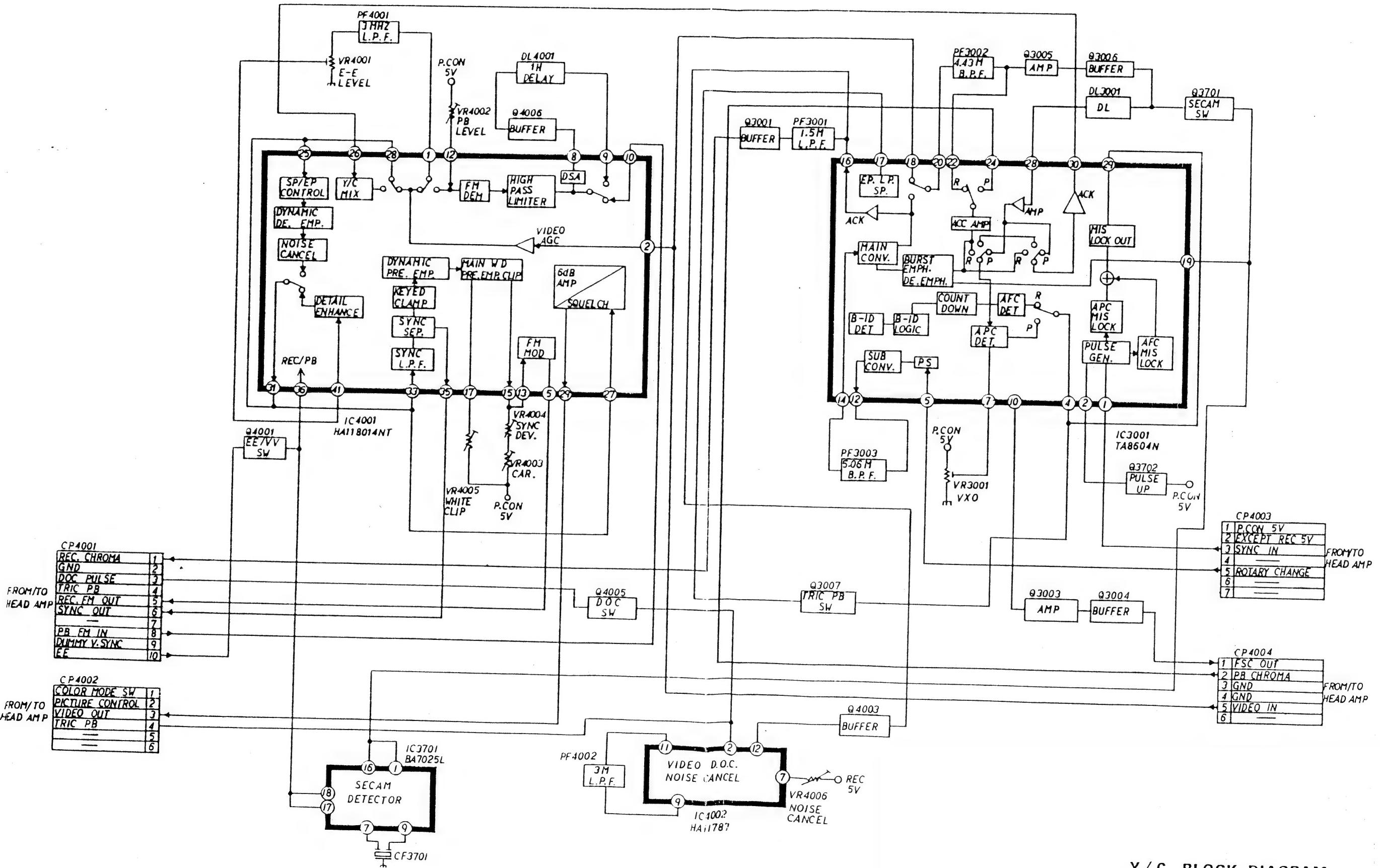
TIMING VALUES IN (ms)
TIMING WAVEFORM : INACTIVE SIDE
 ACTIVE SIDE

SYSTEM CONTROL BLOCK DIAGRAM

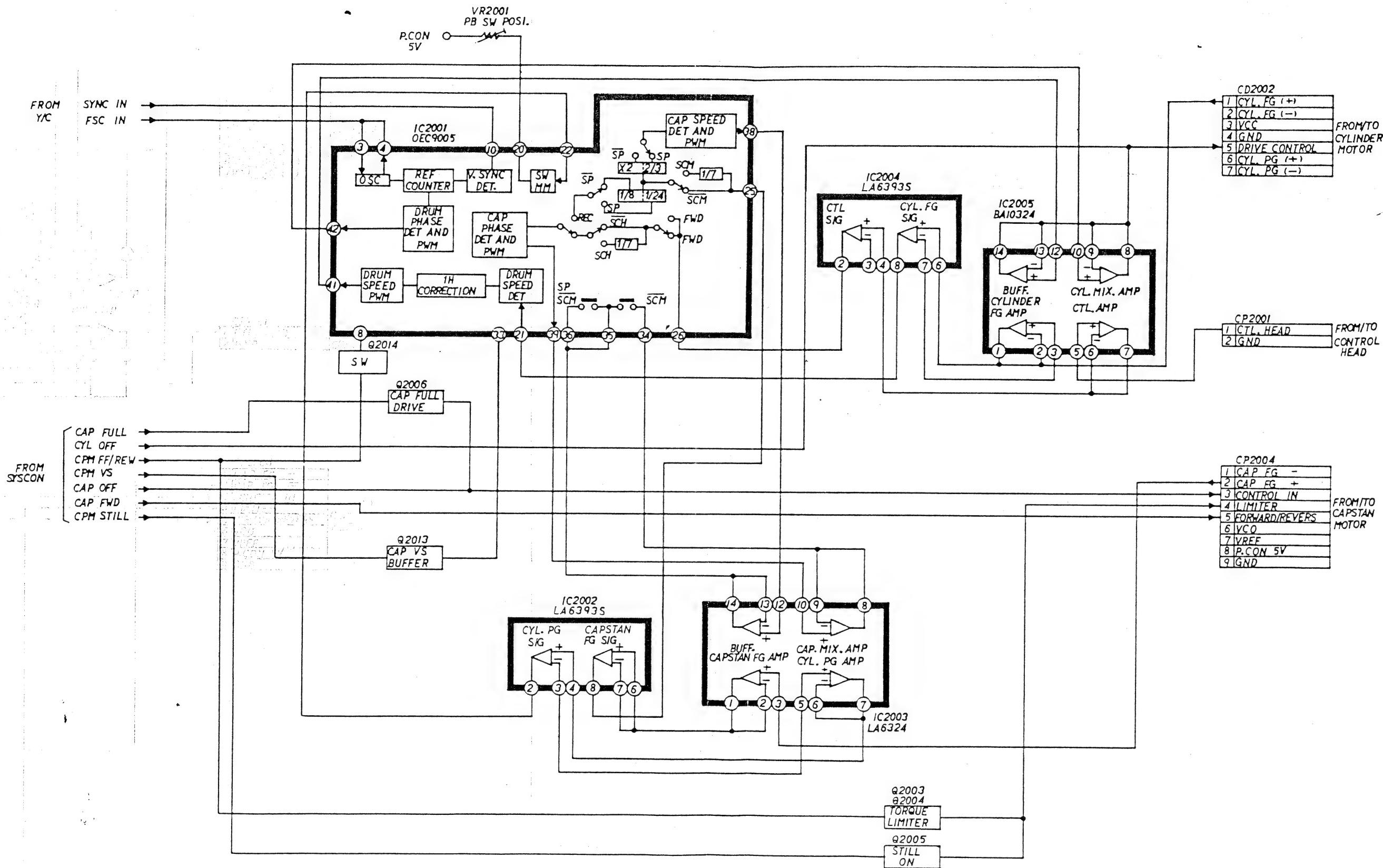


SYSTEM CONTROL BLOCK DIAGRAM

Y / C BLOCK DIAGRAM

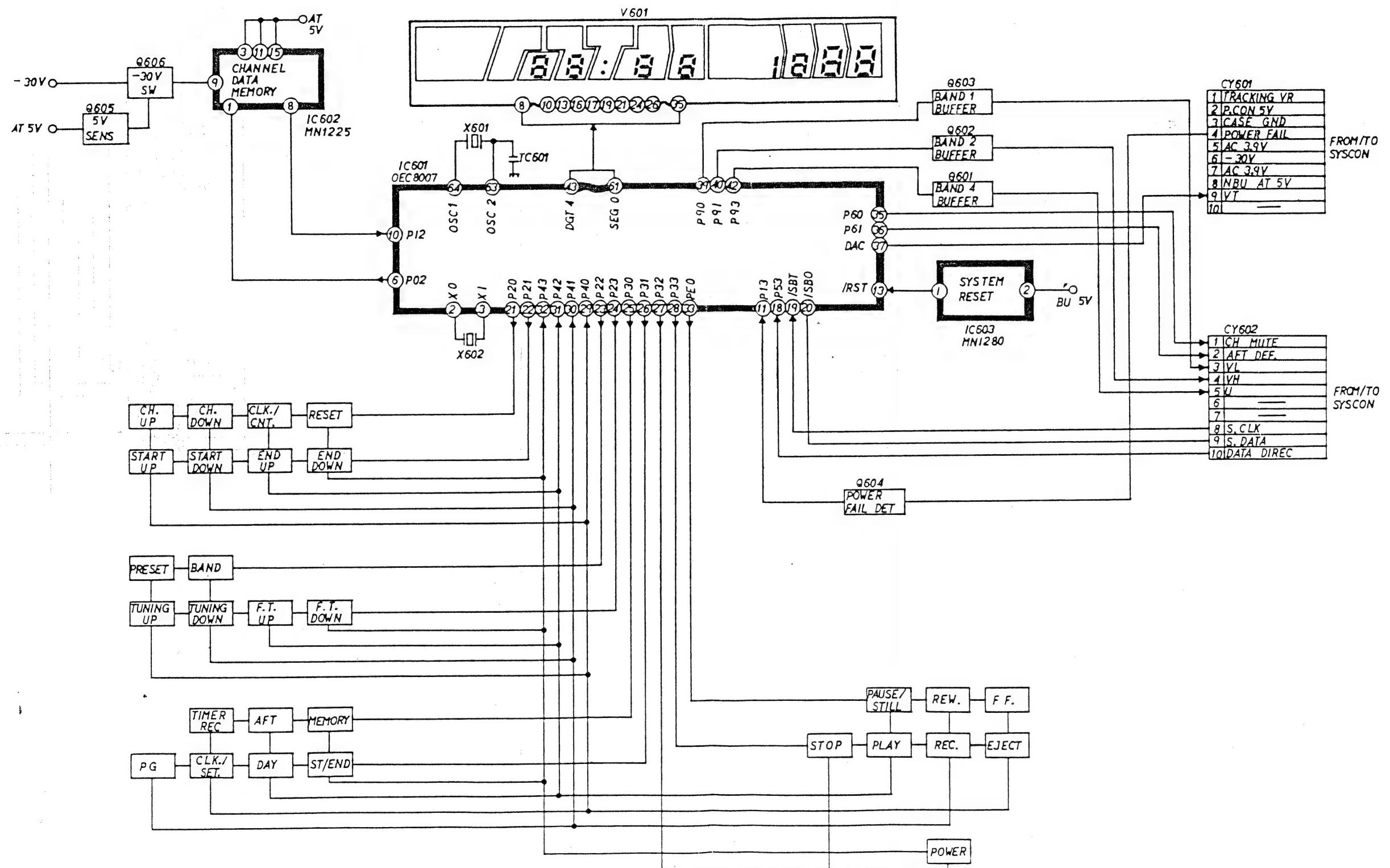


SERVO BLOCK DIAGRAM



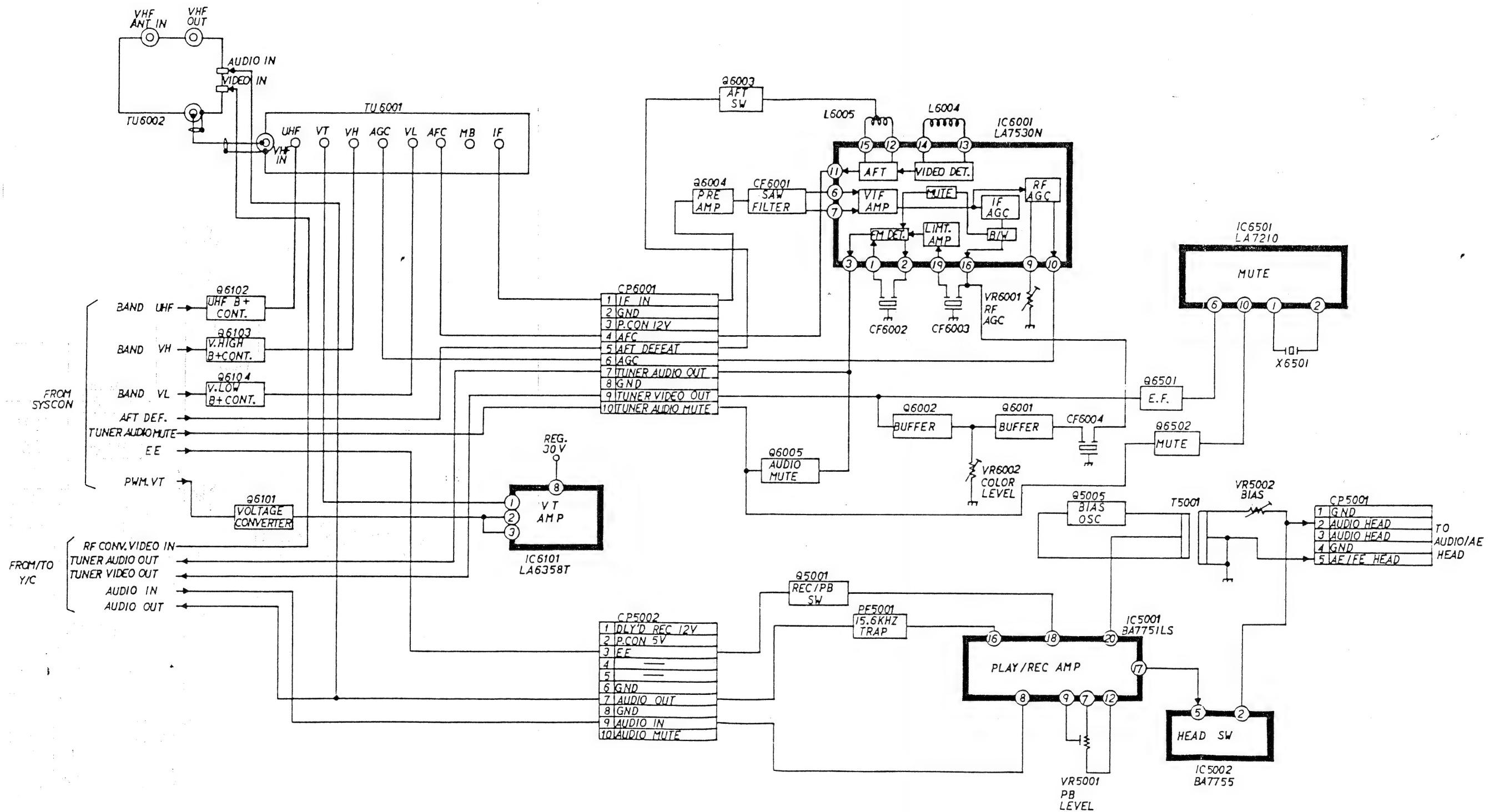
SERVO BLOCK DIAGRAM

OPERATION BLOCK DIAGRAM

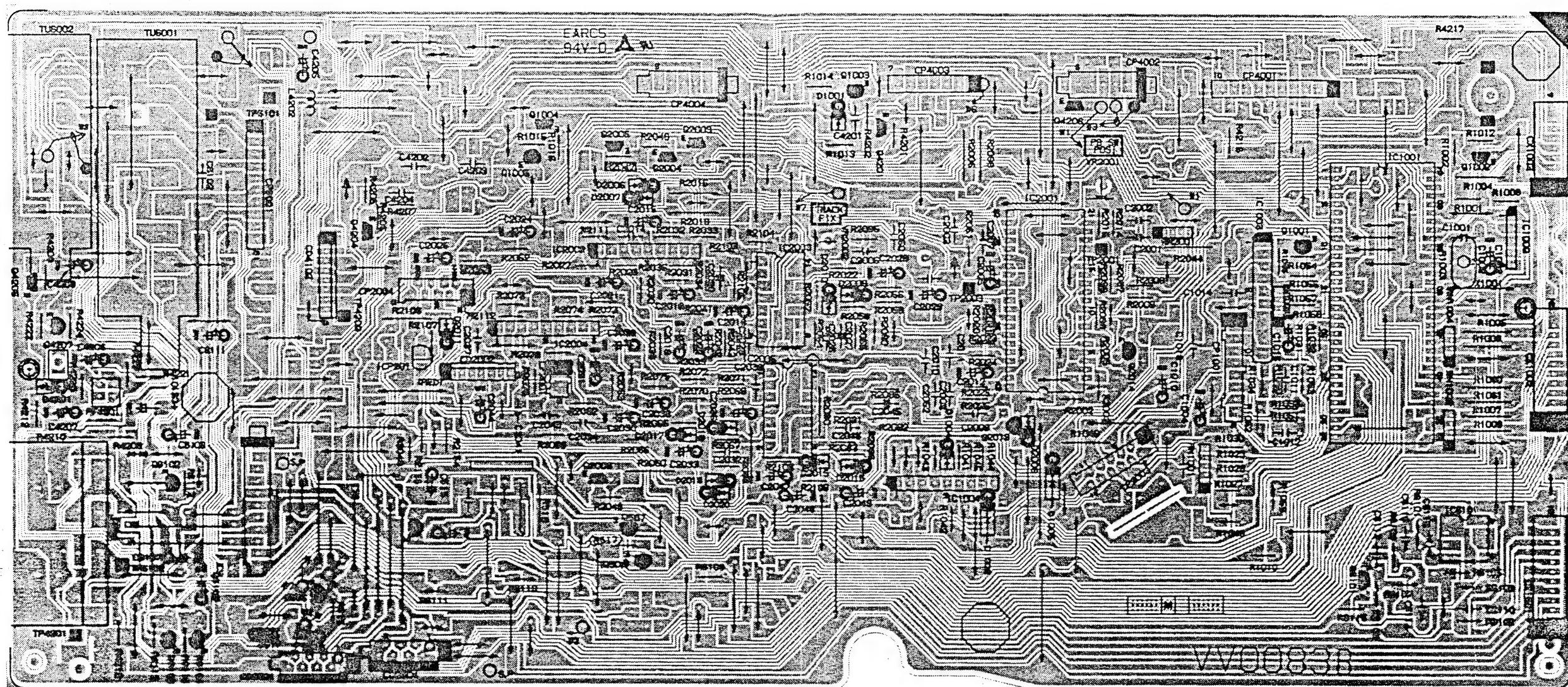


OPERATION BLOCK DIAGRAM

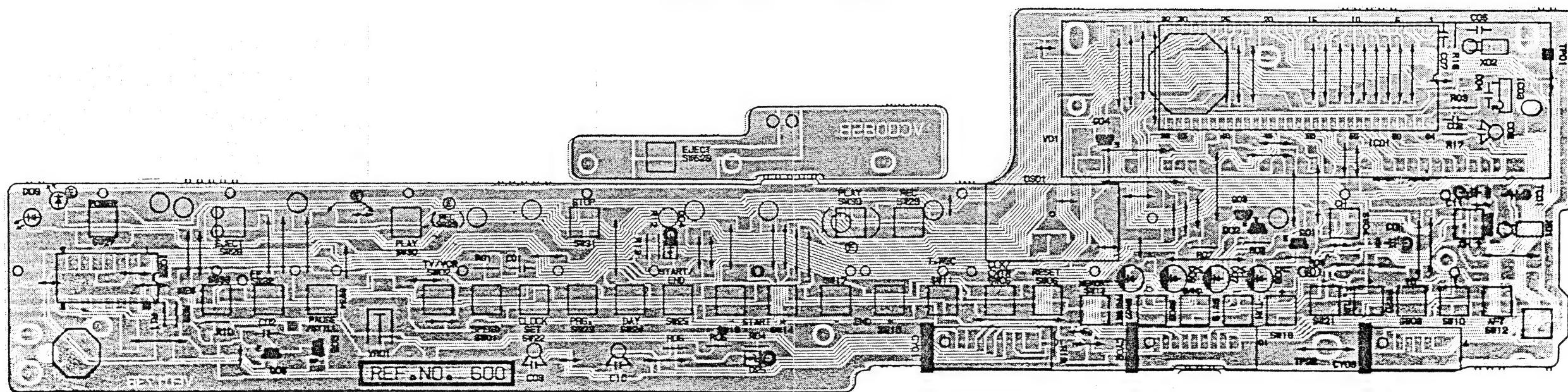
AUDIO / VIF BLOCK DIAGRAM



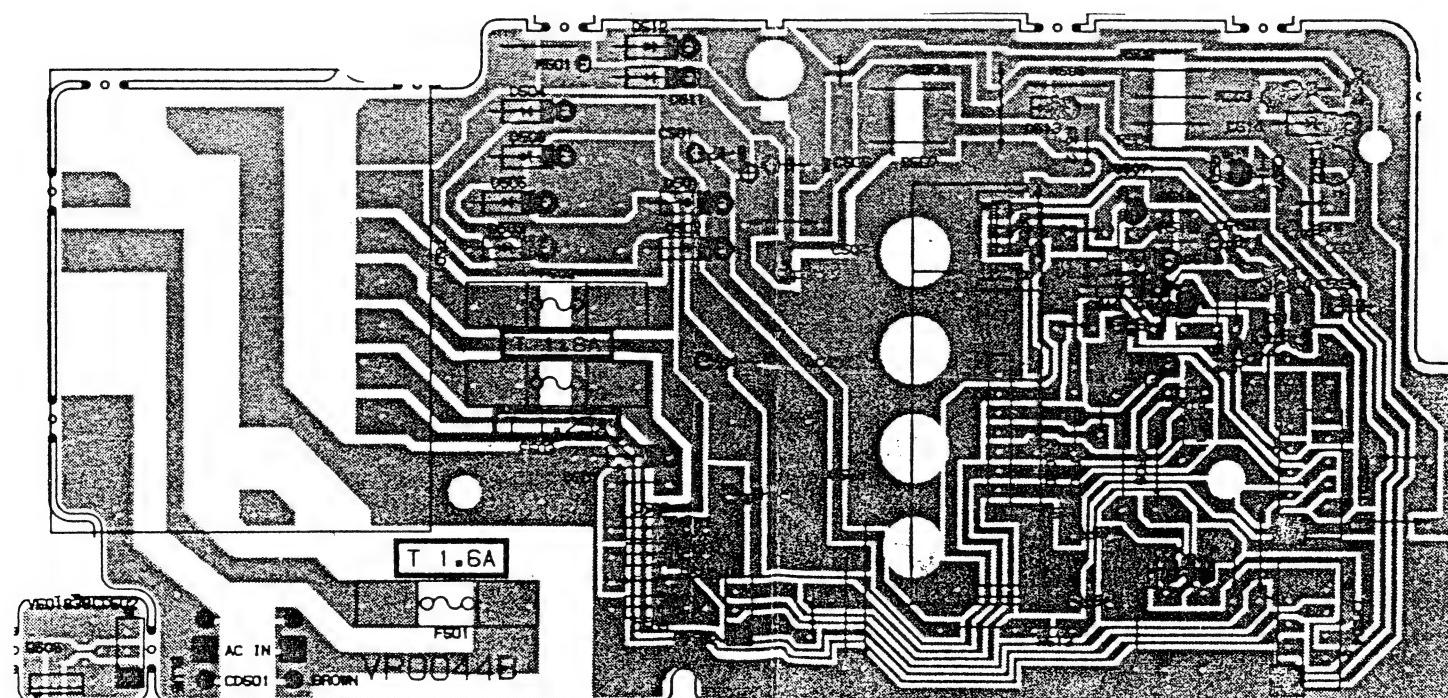
MAIN P.C.BOARD



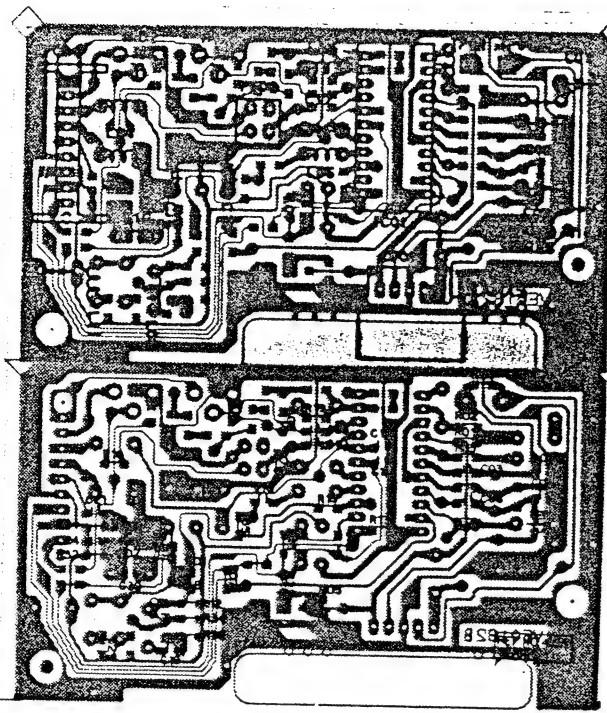
OPERATION P.C.BORD



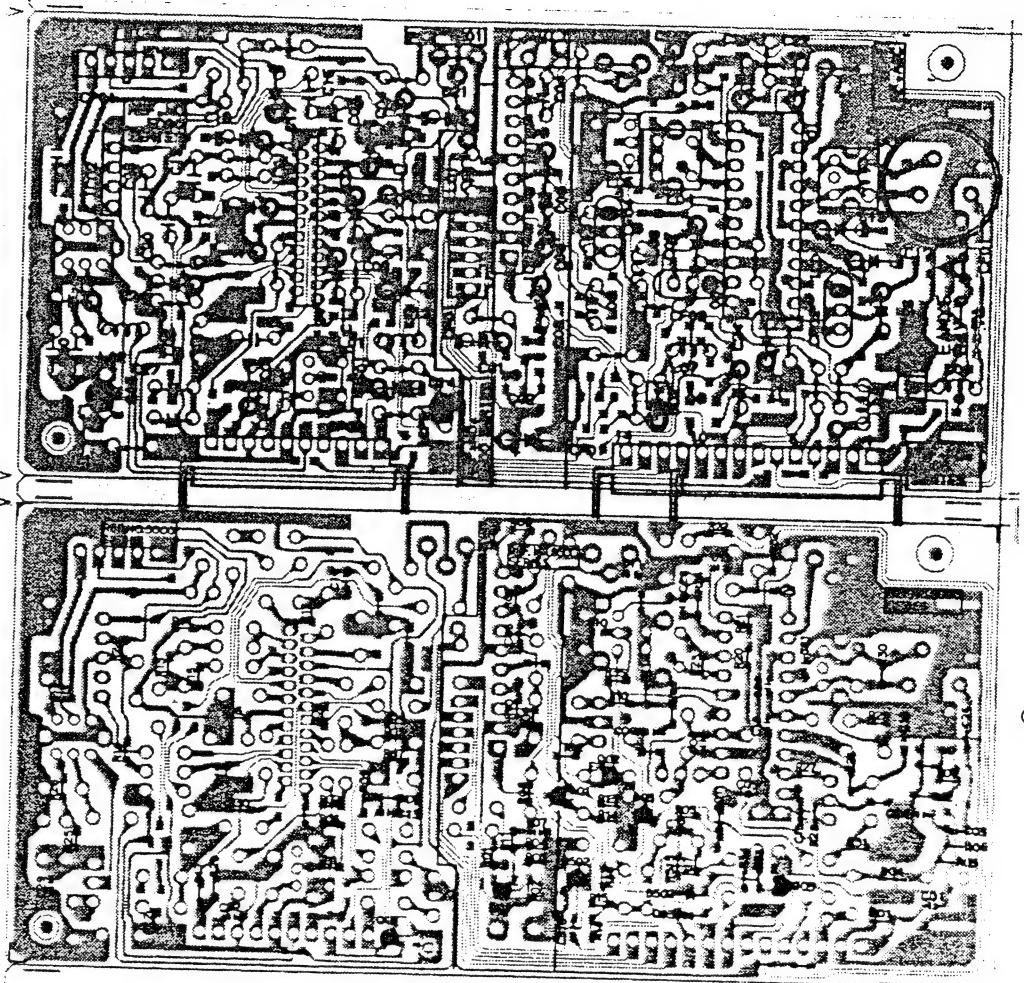
POWER/TRANSISTOR P.C.BOARD



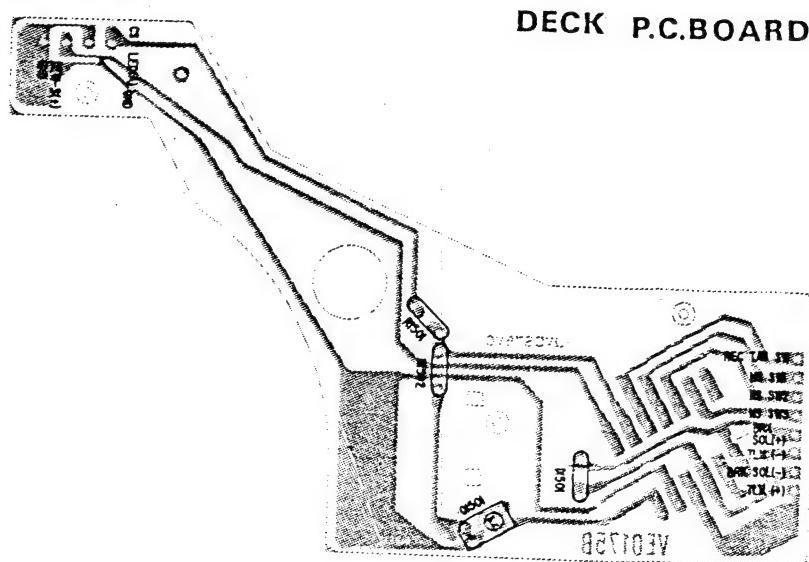
HEAD AMP P.C.BOARD



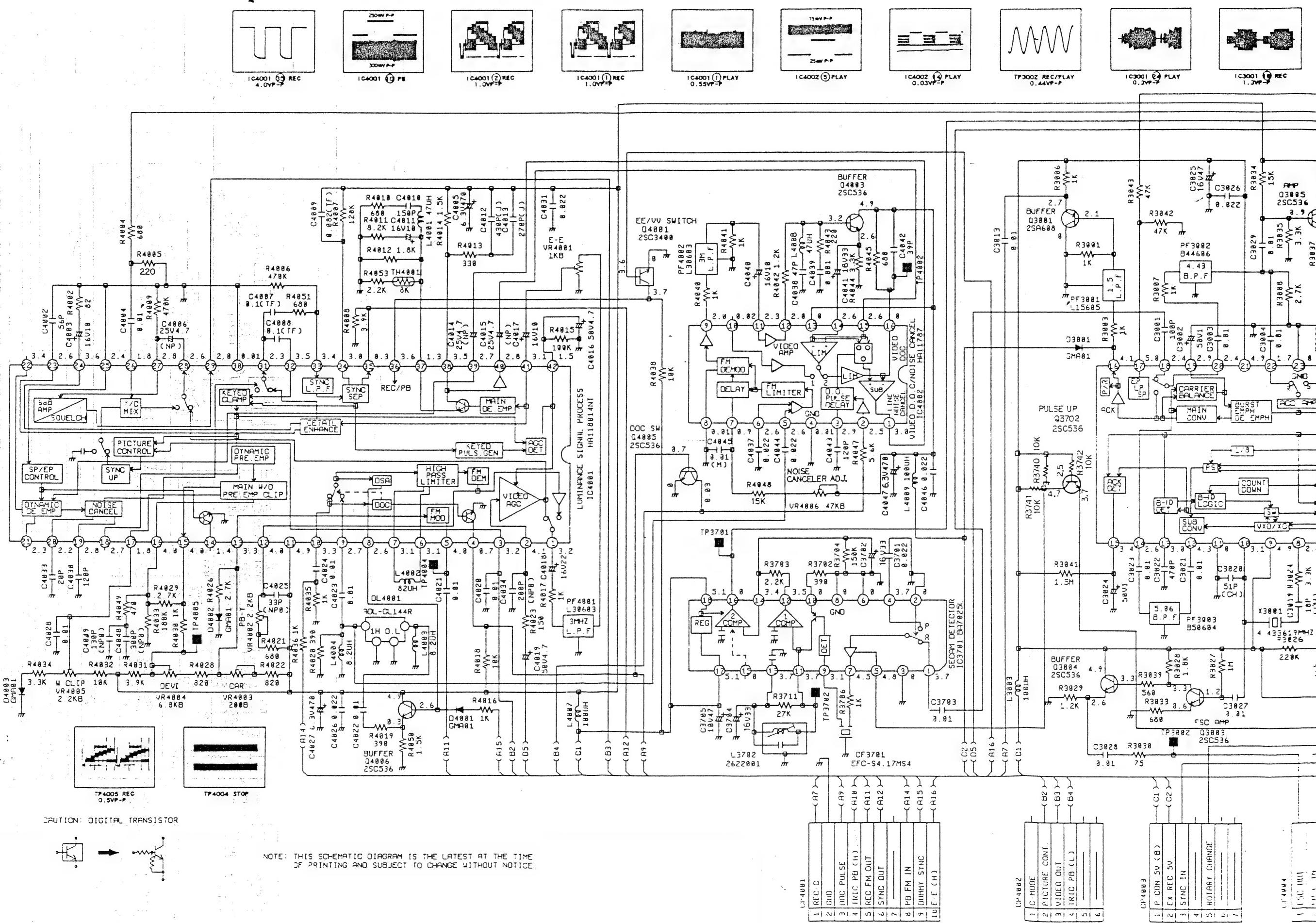
AUDIO/VIF P.C.BOARD



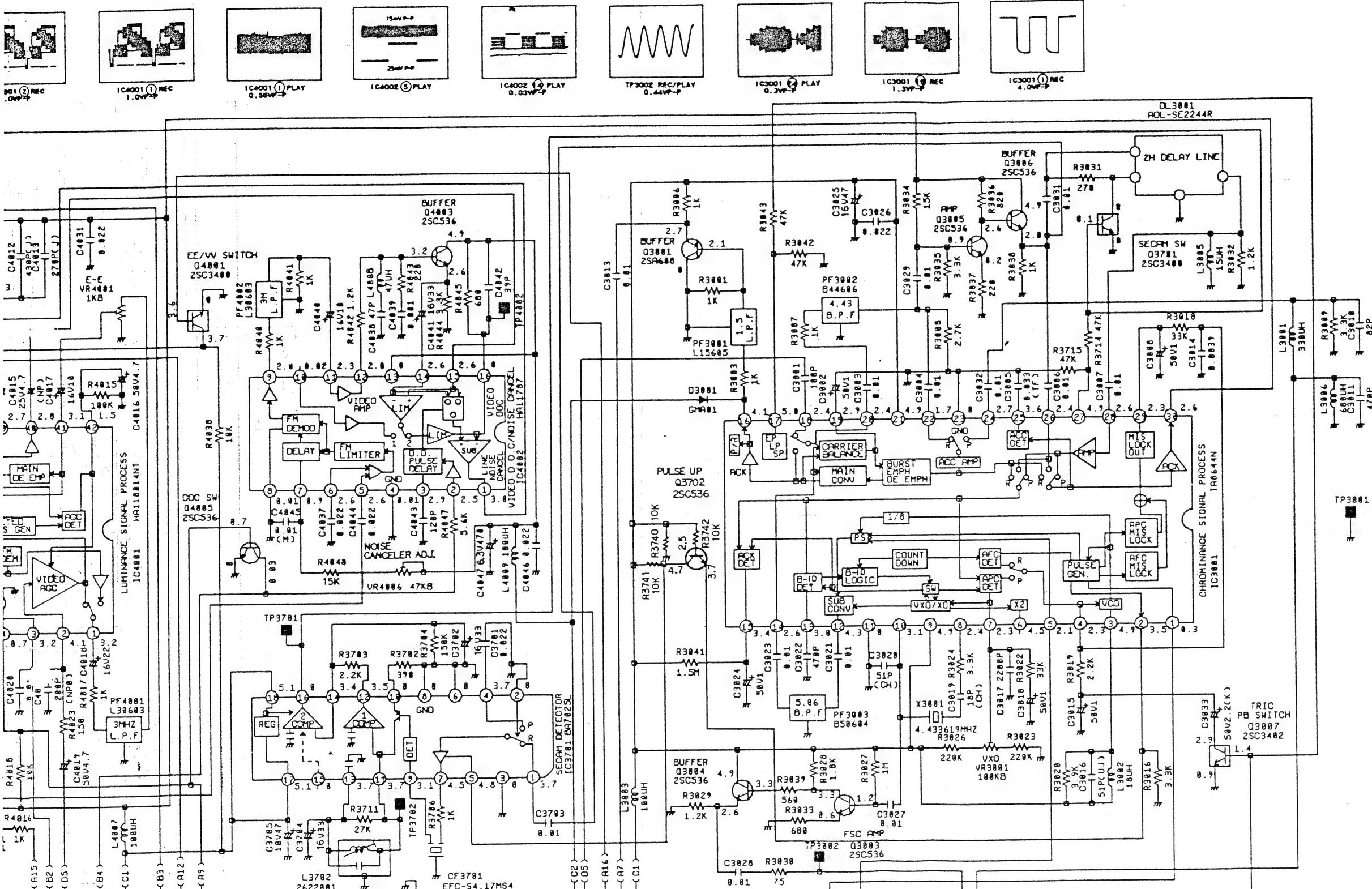
DECK P.C.BOARDS



Y/C SCHEMATIC DIAGRAM



Y/C SCHEMATIC DIAGRAM



AT THE TIME
WITHOUT NOTICE.

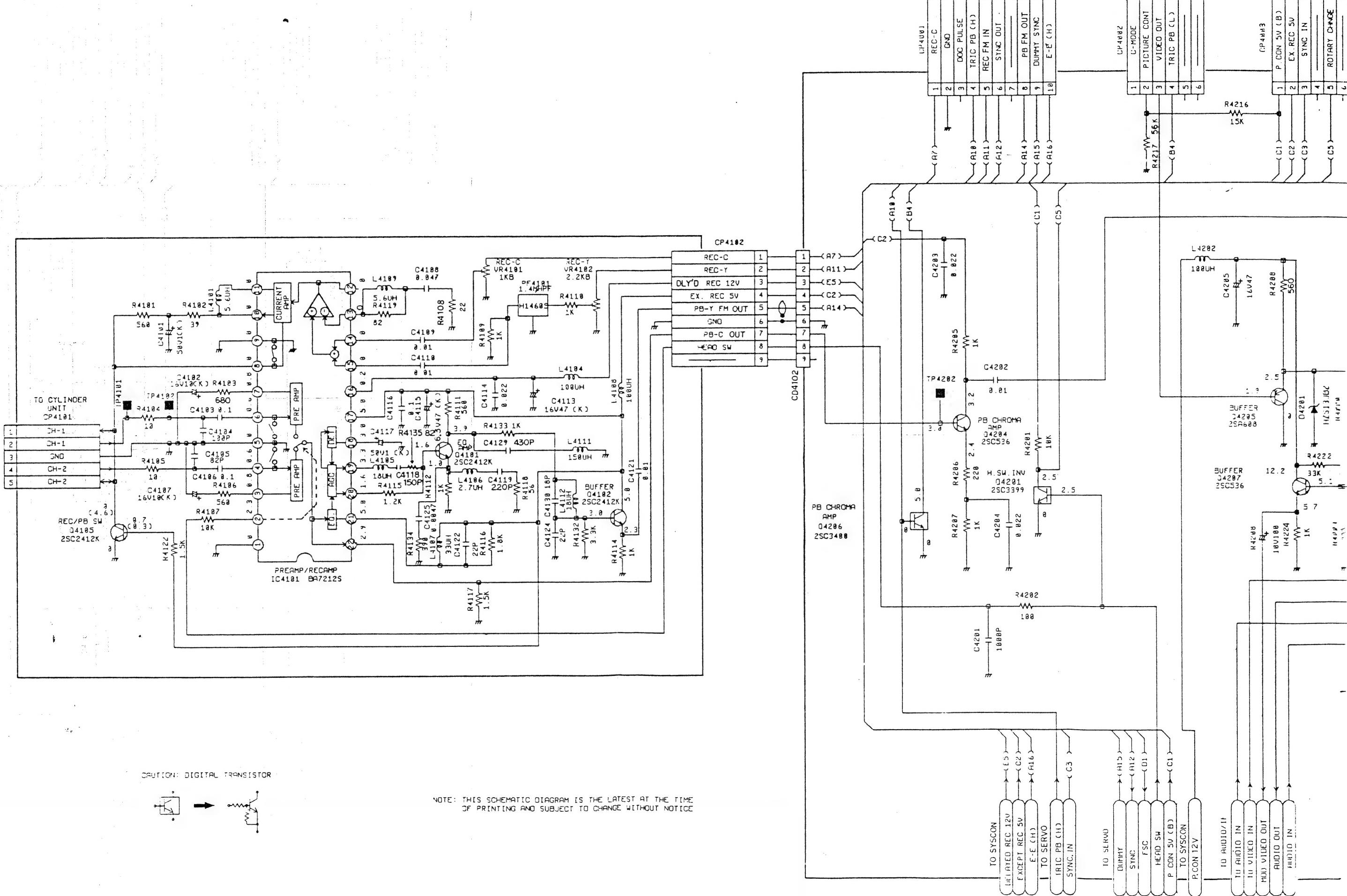
| CP4001 | |
|---------------|-------|
| 1 REC-C | (A7) |
| 2 GND | |
| 3 DOC PULSE | (B2) |
| 4 TRIC PB (H) | (B3) |
| 5 REC FM OUT | (A10) |
| 6 SYNC OUT | (A11) |
| 7 — | (A12) |
| 8 PB FM IN | (A14) |
| 9 DUMMY SYNC | (A15) |
| 10 E-E (CH) | (A16) |

| CP4002 | |
|-----------------|------|
| 1 P CON 5V (B) | (C1) |
| 2 EX REC 5V | (C2) |
| 3 SYNC IN | |
| 4 — | |
| 5 ROTARY CHANGE | |
| 6 — | |
| 7 — | |

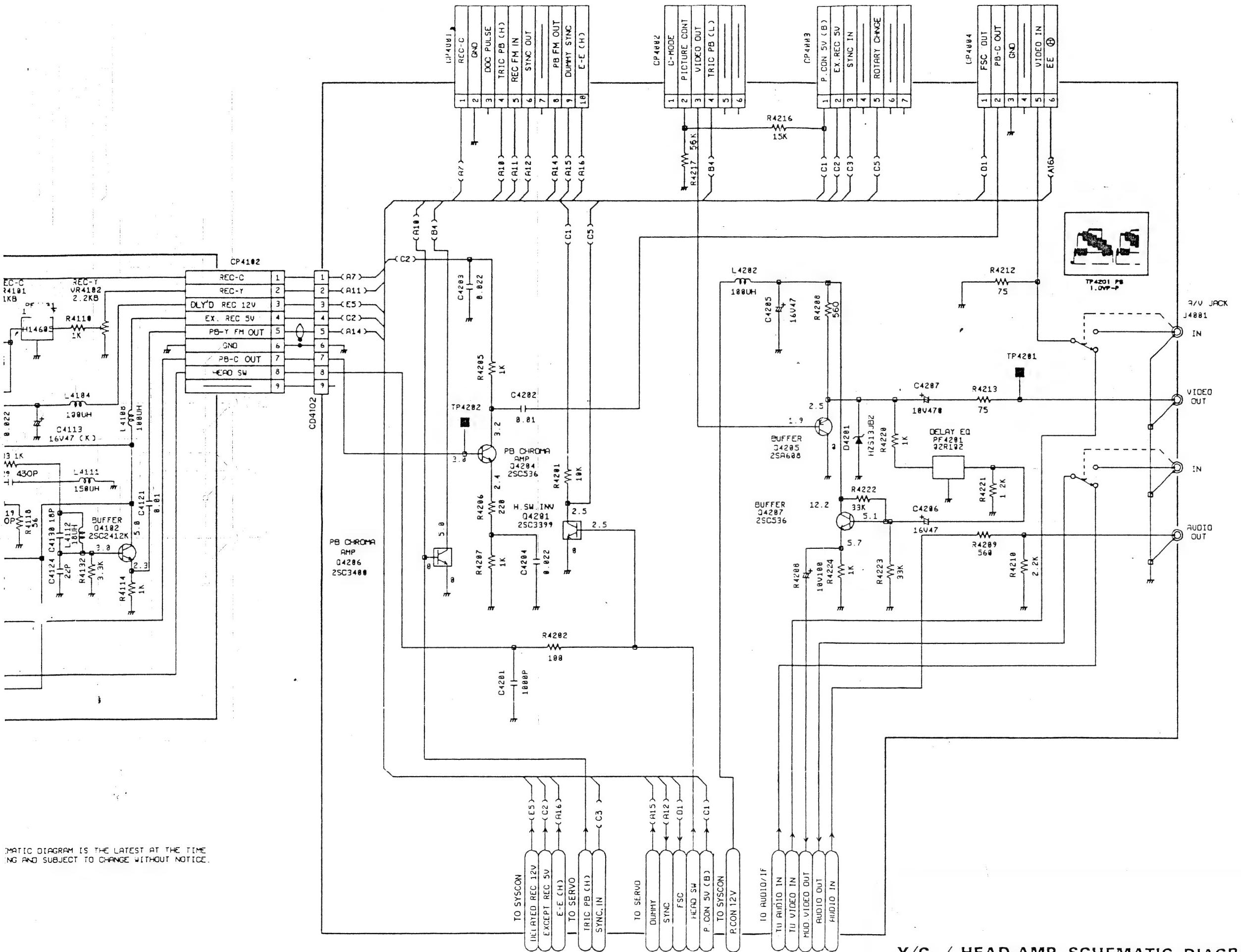
| CP4003 | |
|------------|--|
| 1 FSC OUT | |
| 2 PB C IN | |
| 3 GND | |
| 4 — | |
| 5 VIDEO IN | |
| 6 — | |
| 7 — | |

Y/C SCHEMATIC DIAGRAM

Y/C / HEAD AMP SCHEMATIC DIAGRAM

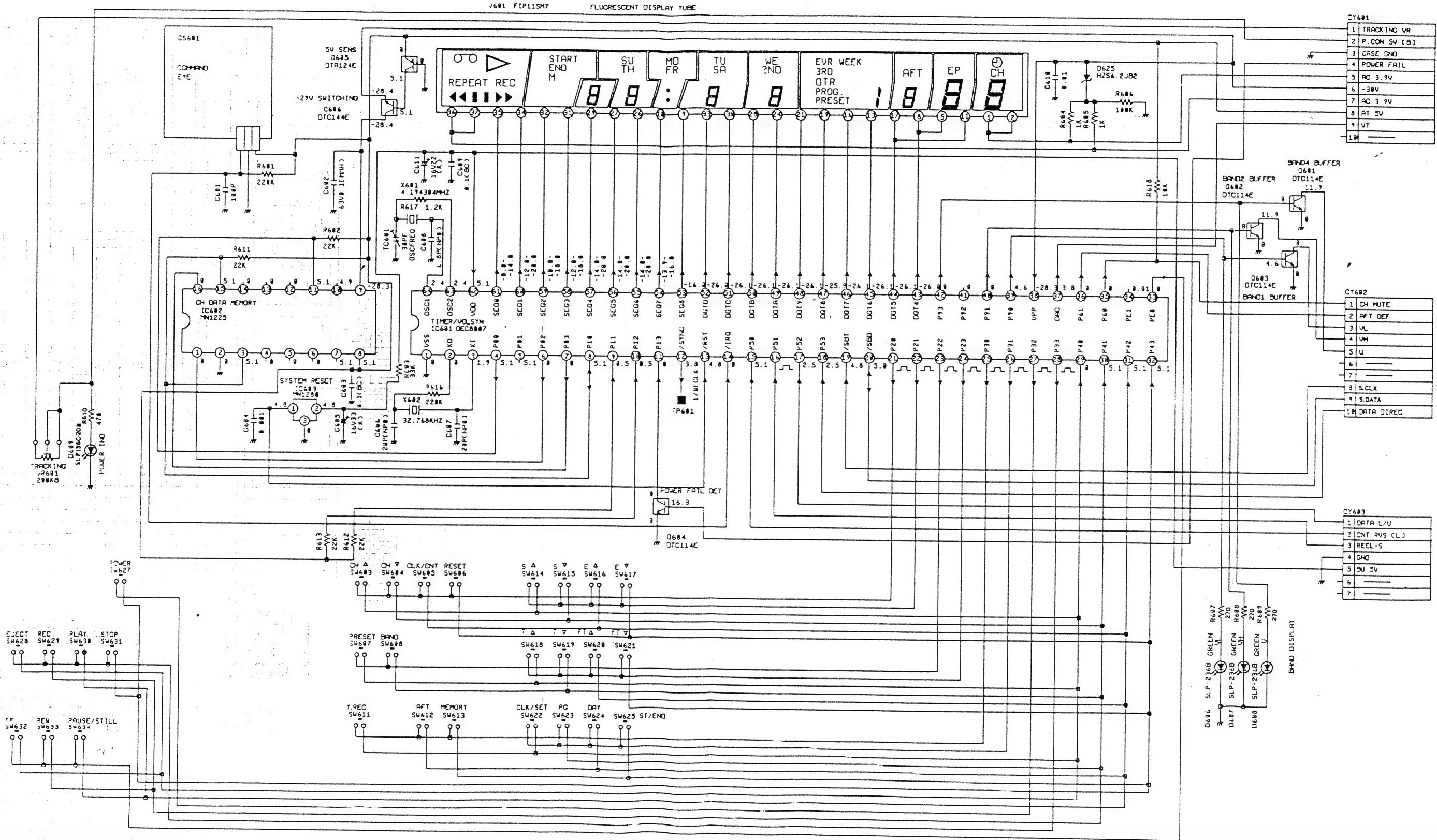


Y/C / HEAD AMP SCHEMATIC DIAGRAM



Y/C / HEAD AMP SCHEMATIC DIAGRAM

OPERATION SCHEMATIC DIAGRAM

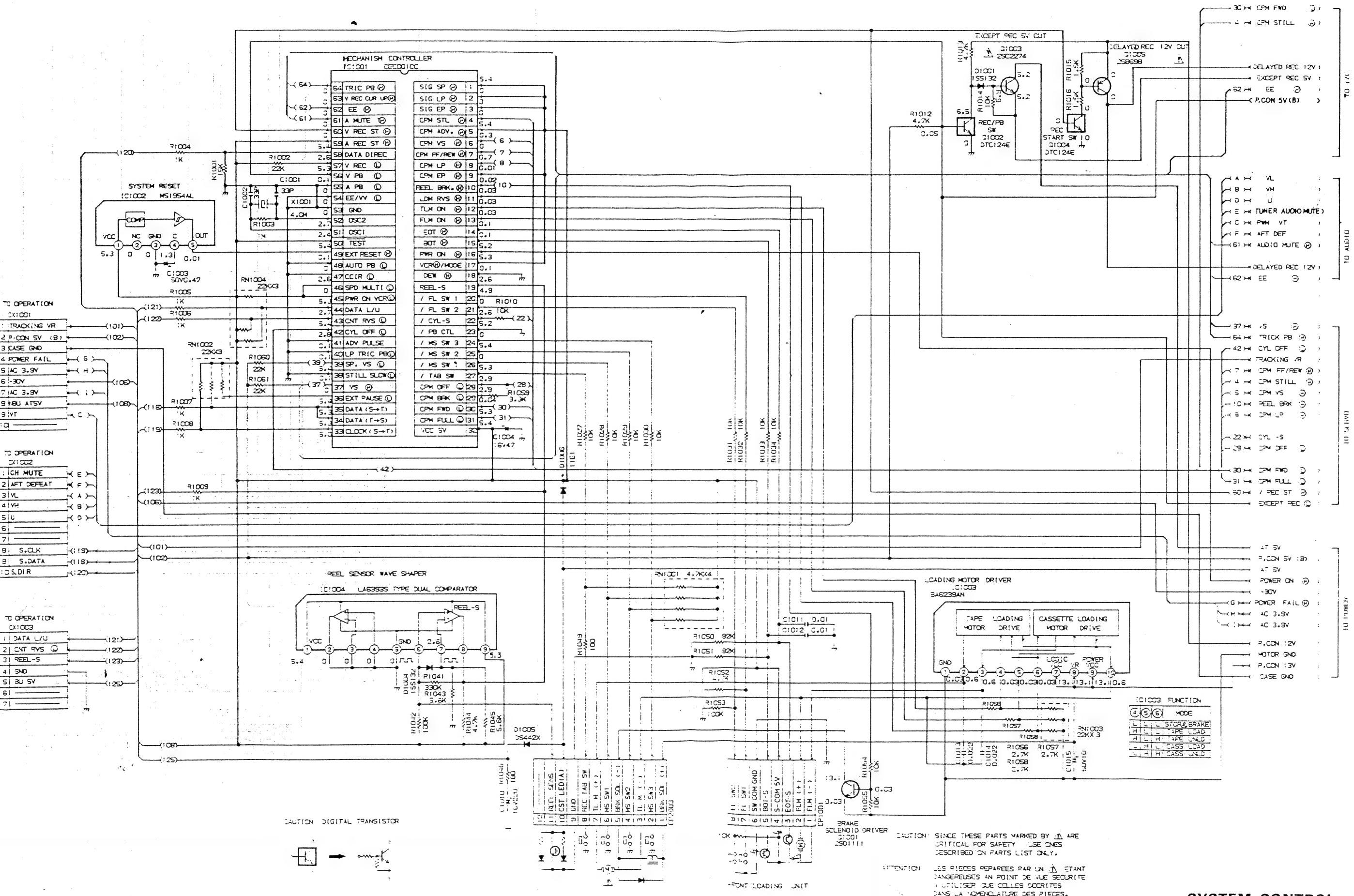


NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME
OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

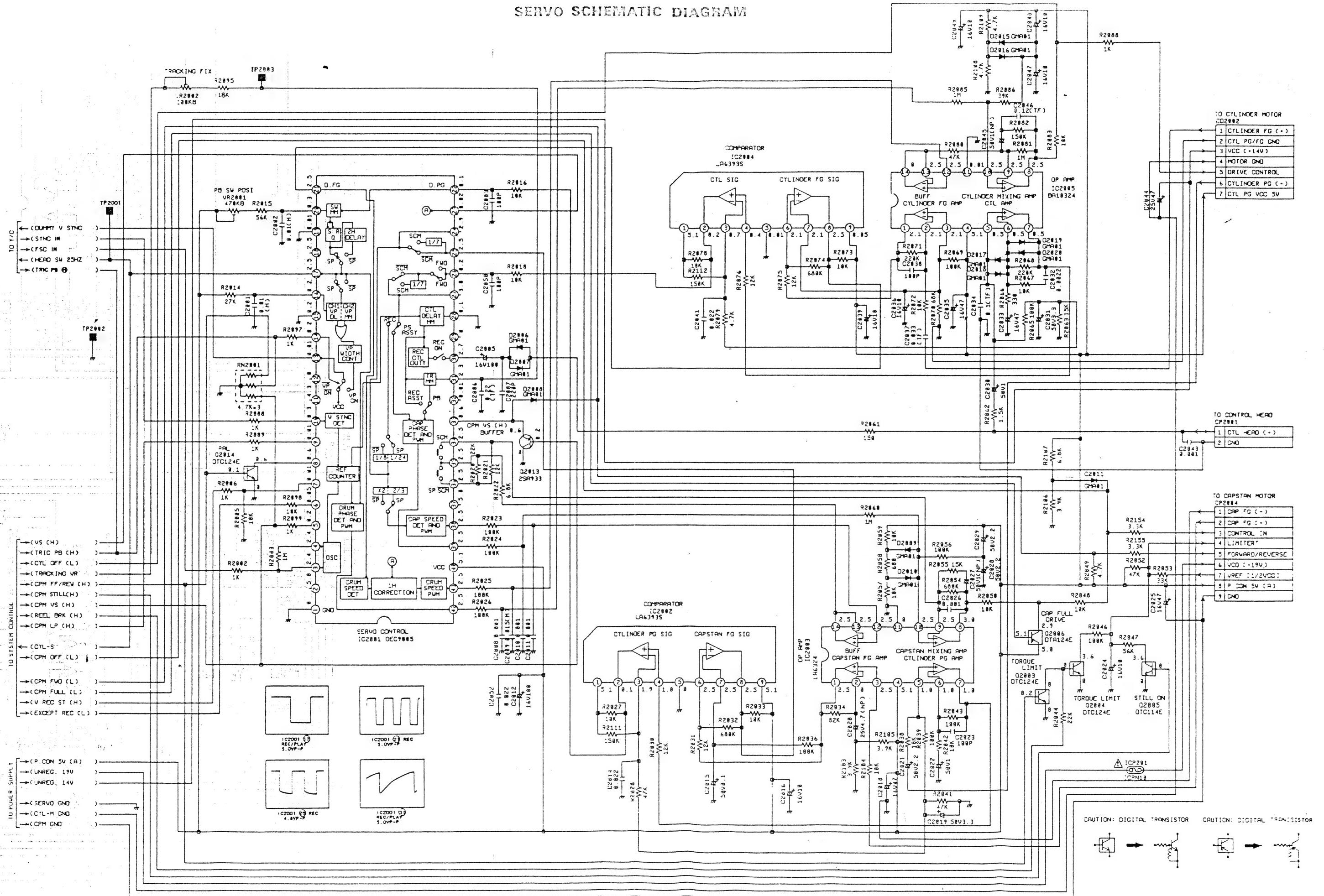
CAUTION: DIGITAL TRANSISTOR

CAUTION: DIGITAL TRANSISTOR

SYSTEM CONTROL SCHEMATIC DIAGRAM



SERVO SCHEMATIC DIAGRAM

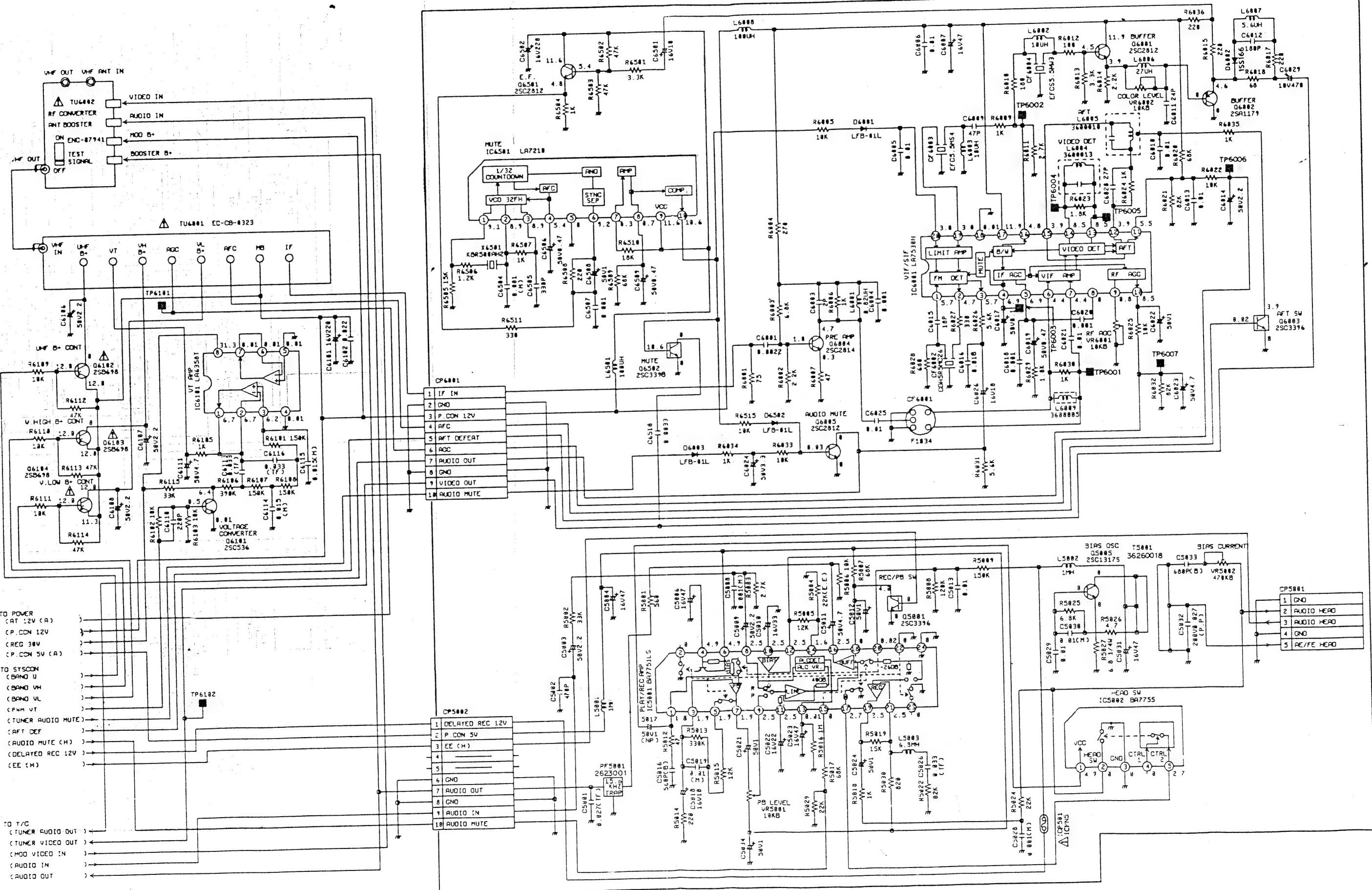


ATTENTION: SINCE THESE PARTS MARKED BY Δ ARE CRITICAL FOR SAFETY, USE ONLY PARTS DESCRIBED ON PARTS LIST ONLY.

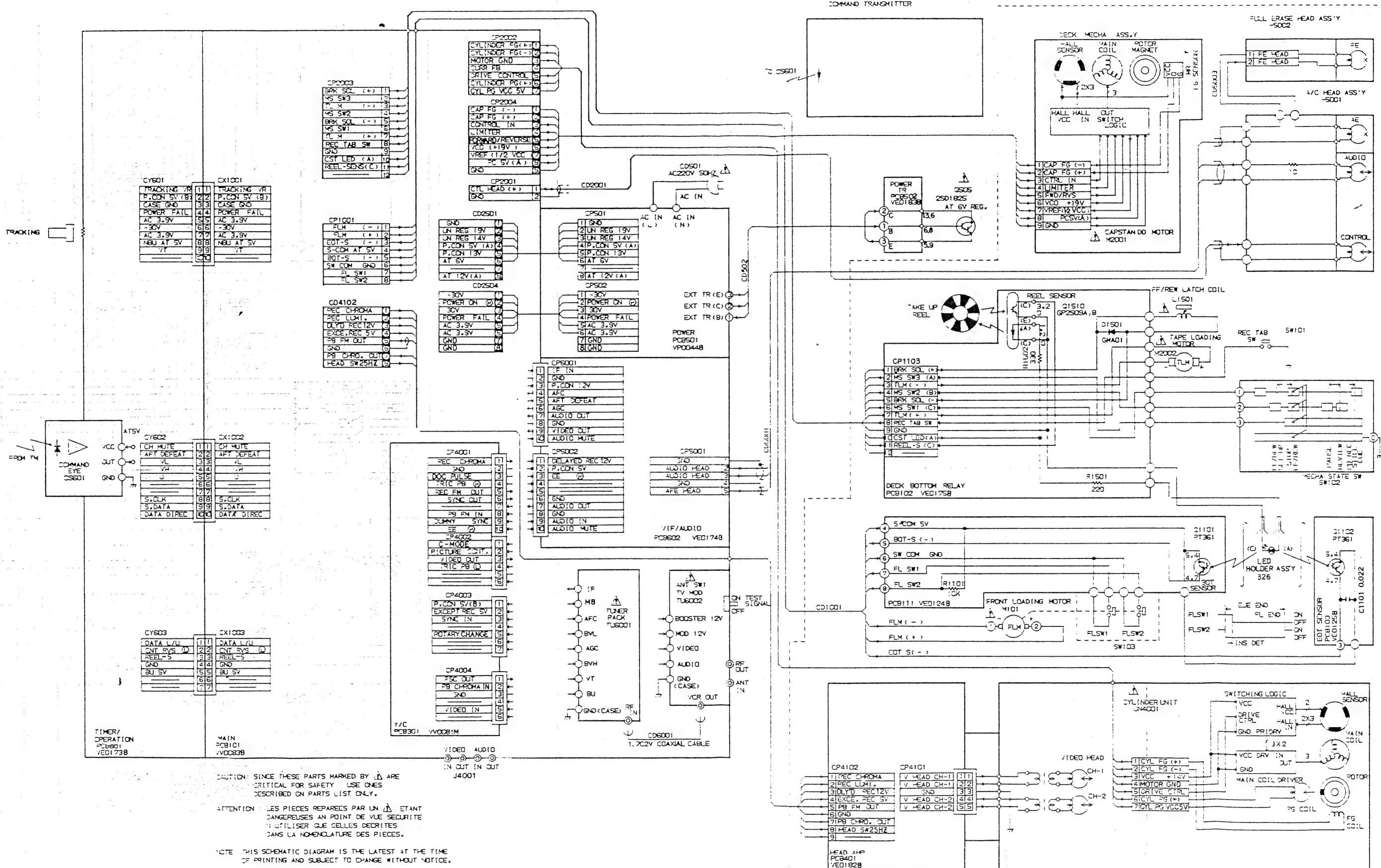
ATTENTION: LES PIECES MARQUES PAR UN Δ SONT DANGEREUSES EN POINT DE VUE SECURITE. UTILISER SEULEMENT LES PIECES DÉCRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

AUDIO/VIF SCHEMATIC DIAGRAM

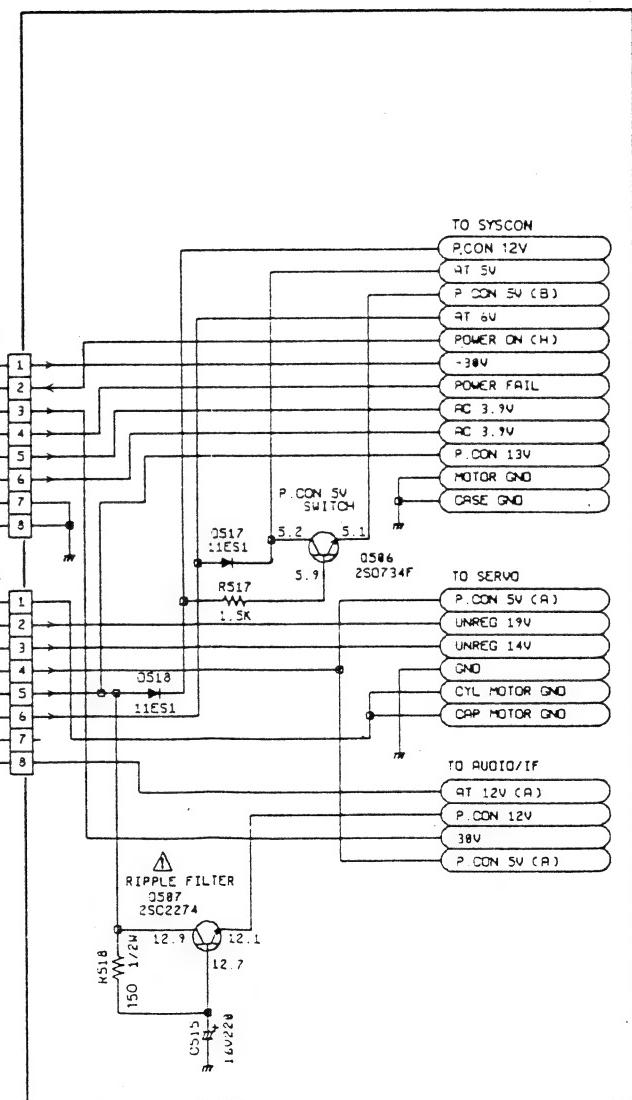
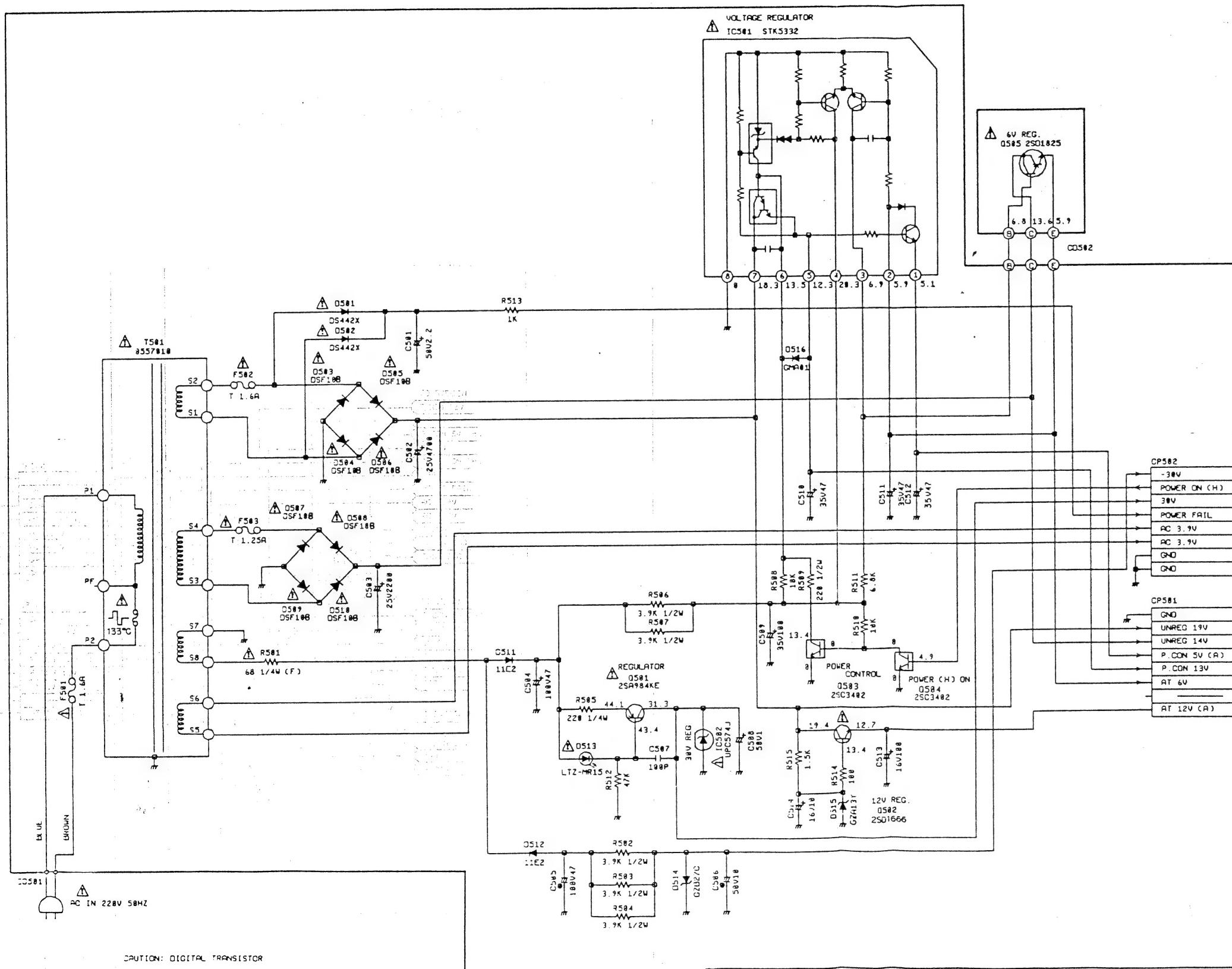


INTERCONNECTION



INTERCONNECTION

POWER SUPPLY SCHEMATIC DIAGRAM



CAUTION: DIGITAL TRANSISTOR

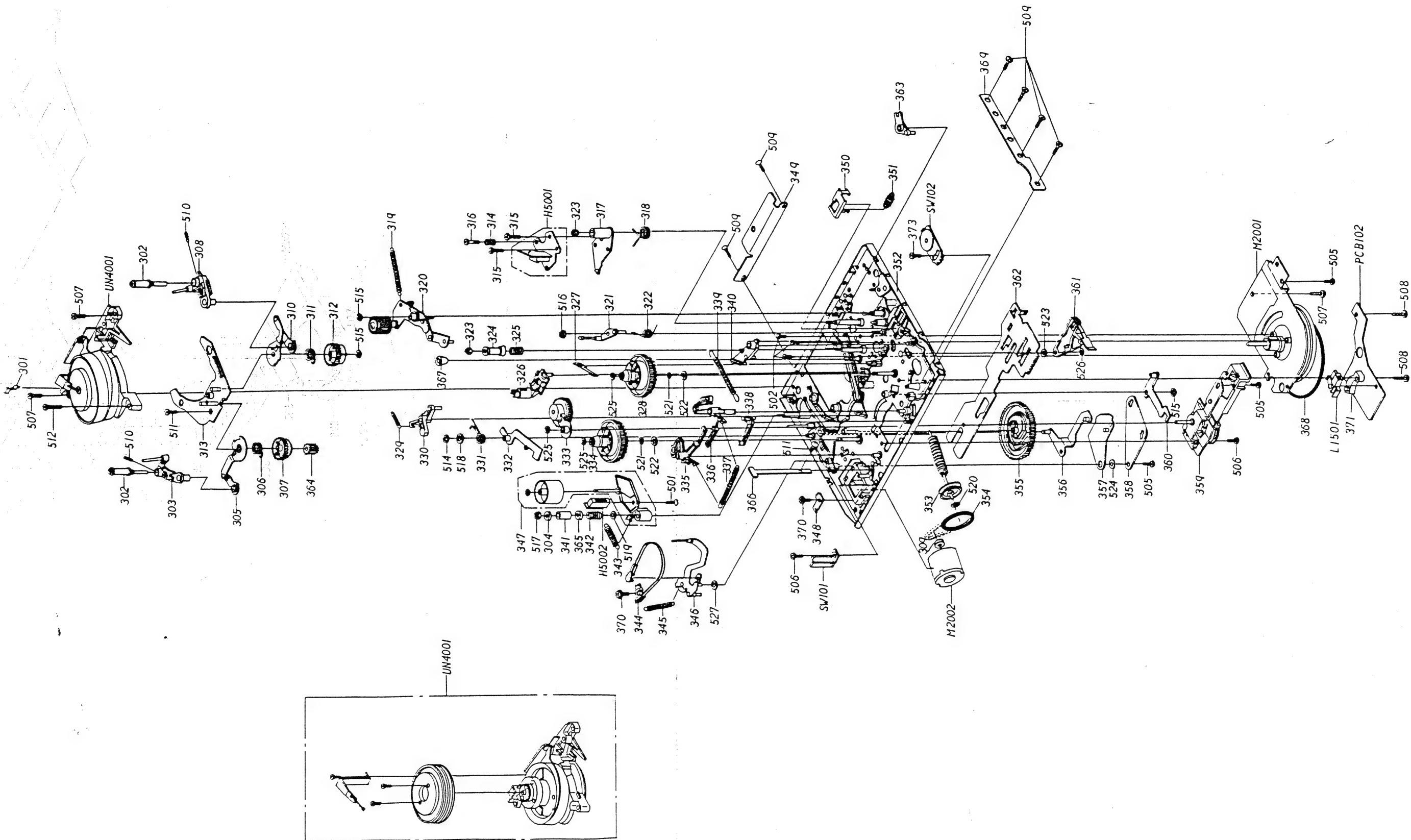
CAUTION: SINCE THESE PARTS MARKED BY  ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED ON PARTS LIST ONLY.

ATTENTION: LES PIECES REPARÉES PAR UN Δ SONT DANGEREUSES EN POINT DE VUE SECURITÉ. NE PAS UTILISER QUE CELLES DÉCRITES DANS LA NOMENCLATURE DES PIÈCES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

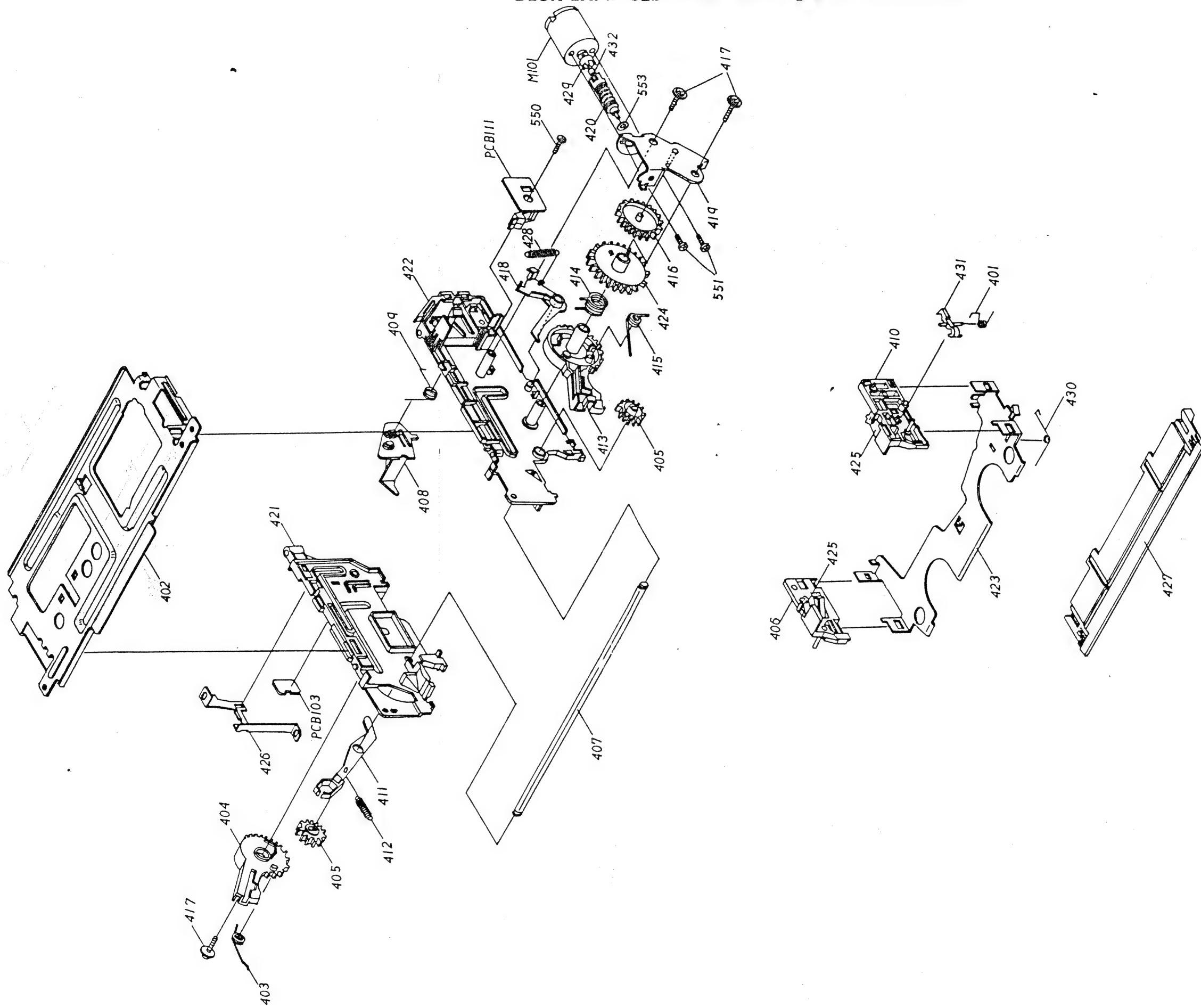
POWER SUPPLY SCHEMATIC DIAGRAM

DECK EXPLODED VIEW



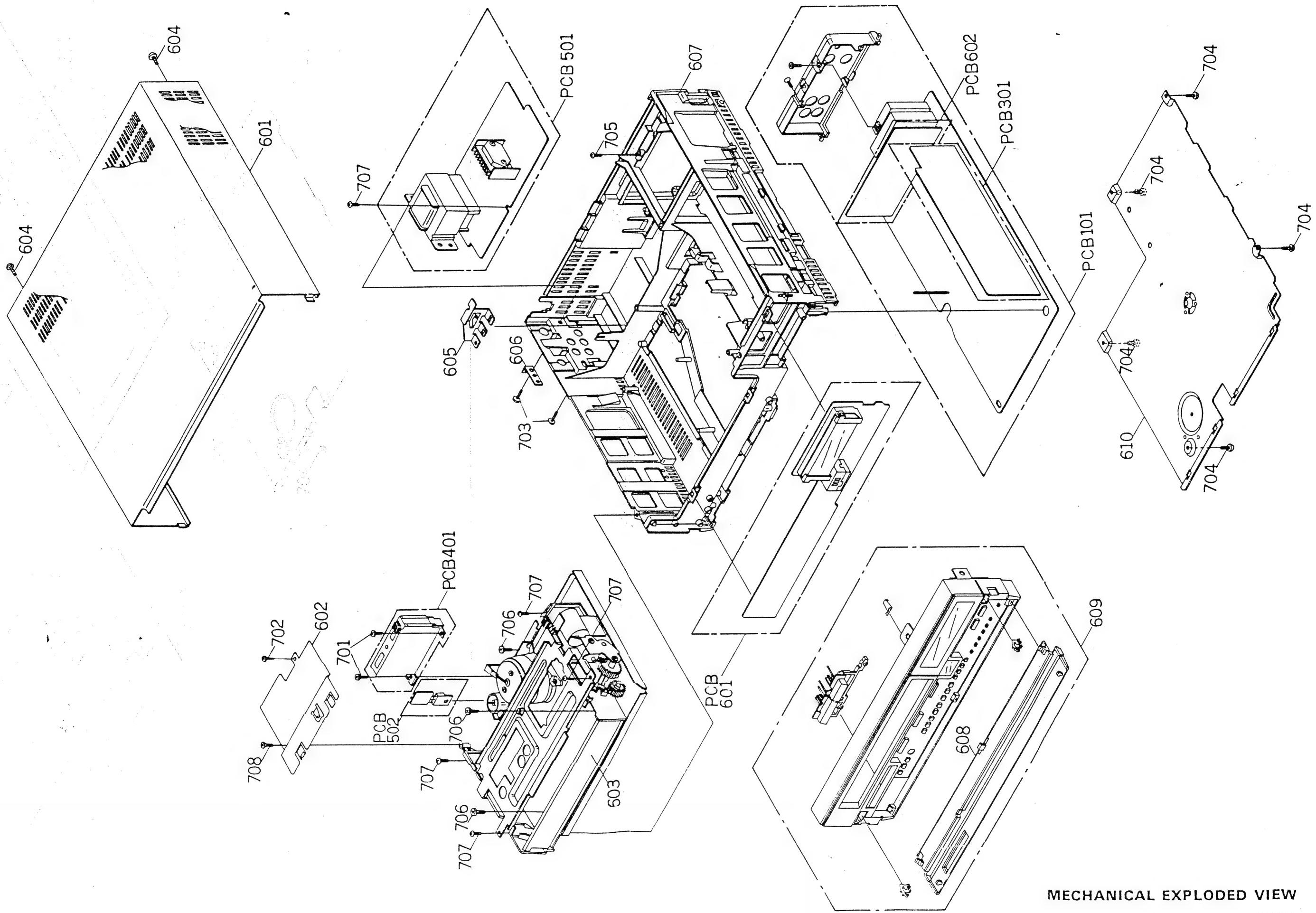
DECK EXPLODED VIEW

DECK EXPLODED VIEW (FL-5) (A41901650K)



DECK EXPLODED VIEW

MECHANICAL EXPLODED VIEW



MECHANICAL EXPLODED VIEW

DECK REPLACEMENT PARTS LIST

| REF. NO | PARTS. NO | DESCRIPTION | REF. NO | PARTS. NO | DESCRIPTION |
|---------|------------|-------------------------------|-------------------|-------------------------------|-------------------------------------|
| 301 | 850P500023 | SPRING,TR. | 414 | 850P900260 | SPRING,CLUTCH |
| 302 | 850A400040 | GUIDE ROLLER ASS'Y | 415 | 850P900262 | SPRING,LINK GEAR R |
| 303 | 850A400038 | INCLINED BASE S ASS'Y | 416 | 850P900243 | WORM WHEEL |
| 304 | 850P600128 | FLANGE,P1(A) | 417 | 788JK0005 | TAP TITE(P) PAN W7.5 2.6*10 UC |
| 305 | 850A300018 | LOADING ARM L ASS'Y | 418 | 850P900239 | LEVER CAM |
| 306 | 850P800083 | SPRING,LOADING GEAR L | 419 | 850A900045 | BRACKET,MOTOR ASS'Y |
| 307 | 850P300055 | GEAR,LOADING L | 420 | 850P900245 | WORM |
| 308 | 850A400039 | INCLINED BASE R ASS'Y | 421 | 850P900251 | BRACKET,SIDE L |
| 309 | 850P600113 | PULLEY,LOADING MOTOR | 422 | 850P900252 | BRACKET,SIDE R |
| 310 | 850A300019 | LOADING ARM R ASS'Y | 423 | 850A900044 | CASS.HOLDER SUB ASS'Y |
| 311 | 850P800084 | SPRING,LOADING GEAR R | 424 | 850P900244 | CLUTCH GEAR |
| 312 | 850P300056 | GEAR,LOADING R | 425 | 850P900257 | SPRING CASS.HOLDER |
| 313 | 850A100006 | LOADING BASE ASS'Y | 426 | 850P900271 | PLATE,EARTH L |
| 314 | 850P800071 | SPRING,AZIMUTH | 427 | 850P900248 | TAPE GUIDE PIECE |
| 315 | 868XOHH804 | CONEHEAD SCREW M3*8 CH | 428 | 850P900273 | SPRING,LEVER CAM (A) |
| 316 | 868512H34 | JOINT SCREW BIND M3*13 CH | 429 | 850P900217 | WORM DRIVER |
| 317 | 850A500003 | AC HEAD BASE ASS'Y | 430 | 850P900264 | SPRING,LOCKER R |
| 318 | 850P800070 | SPRING,AC HEAD BASE | 431 | 850P900242 | REMOVING |
| 319 | 850P800077 | SPRING,PINCH ROLLER | 432 | 850P900229 | BUSH RUBBER |
| 320 | 850A400041 | PINCH ROLLER ARM ASS'Y | 501 | 868022D404 | BIND M2*4 CH |
| 321 | 850A400044 | LIMITER POST ARM ASS'Y | 502 | 8680K1G604 | SEMS K M2.6*6 CH |
| 322 | 850P800073 | SPRING,LIMITER POST | 505 | 8680T2H604 | TAP TITE(S) BIND 3*6 CH |
| 323 | 850P500010 | ADJUST NUT | 506 | 8680T2H804 | TAP TITE(S) BIND 3*8 CH |
| 324 | 850P600139 | POST,SLEEVE 2 | 507 | 8680T2H804 | TAP TITE(S) BIND 3*10 CH |
| 325 | 850P800076 | SPRING,P4 | 508 | 8680T2H44 | TAP TITE(S) BIND 3*14 CH |
| 326 | 850A700003 | LED HOLDER ASS'Y | 509 | 8680T3H604 | TAP TITE(S) FLAT 3*6 CH |
| 327 | 850A600049 | TB BRAKE ARM ASS'Y | 510 | 8685DZD302 | SET SCREW 6CUP POINT M2*3 BK |
| 328 | 850A200007 | REEL DISK T ASS'Y | 511 | 868102H804 | TAP TITE(P) BIND 3*8 CH |
| 329 | 850P800079 | SPRING,SS BRAKE | 512 | 8680T2HA64 | TAP TITE(S) BIND 3*16 CH |
| 330 | 850A600037 | SS BRAKE ARM ASS'Y | 514 | 868NETW251 | E-RING 2.5 |
| 331 | 850P800081 | SPRING,TENSION LEVER 2 | 515 | 868NETW301 | E-RING 3.0 |
| 332 | 850A600047 | TENSION LEVER 2 ASS'Y | 516 | 868N008304 | NYLON NUT M3 |
| 333 | 850A200004 | IDLER ASS'Y | 517 | 868N007304 | NYLON NUT M3 |
| 334 | 850A200006 | REEL DISK S ASS'Y | 518 | 868WA32AOU | WASHER 3.2*10*T0.8 |
| 335 | 850A600041 | MAIN BRAKE ARM L ASS'Y | 519 | 868WA4380Q | WASHER 4.3*8.0*T0.5 |
| 336 | 850A600042 | MAIN BRAKE ARM R ASS'Y | 520 | 868WP2647E | POLYSLIDER WASHER 2.6*4.7*T0.13 |
| 337 | 850P800074 | SPRING,MAIN BRAKE | 521 | 868WP3144E | POLYSLIDER WASHER 3.1*4.4*T0.13 |
| 338 | 850A600044 | MB CONNECT ASS'Y | 522 | 868WP3144J | POLYSLIDER WASHER 3.1*4.4*T0.25 |
| 339 | 850P800091 | SPRING,TS BRAKE 2 | 523 | 868WP4290Q | POLYSLIDER WASHER 4.2*9.0*T0.5 |
| 340 | 850A600056 | TS BRAKE ARM 2 ASS'Y | 524 | 868WP6290U | POLYSLIDER WASHER 6.2*9.0*T0.5 |
| 341 | 850P600130 | POST,SLEEVE P1 | 525 | 868WQ2647N | POLYSLIDER WASHER(CUT) 2.6*4.7*T0.4 |
| 342 | 850P800075 | SPRING,P1 | 526 | 868WQ3154N | POLYSLIDER WASHER(CUT) 3.1*5.4*T0.4 |
| 343 | 850P800072 | SPRING,FE HEAD ARM | 527 | 868WP3170J | POLYSLIDER WASHER 3.1*7.0*T0.25 |
| 344 | 850A600045 | TENSION BAND ASS'Y | 550 | 868101G604 | TAP TITE(P) PAN 2.6*6 |
| 345 | 850P800080 | SPRING,TENSION ARM | 551 | 8680A1H404 | SEMS A M3*4 CH |
| 346 | 850A400046 | TENSION ARM ASS'Y | 553 | 868WP3254J | POLYSLIDER WASHER 3.2*5.4*T0.25 |
| 347 | 850A500004 | FE HEAD ARM ASS'Y | C1101 | CH4FF03H4Z CC RHTP050F223Z-KF | 22000 PF 25V |
| 348 | 850P600120 | PLATE,ADJUST TENSION | CD1001 | 068318046A | CORD EIS CONNECTOR 8318046A |
| 349 | 850P000095 | FRAME,DECK BACK | CD2001 | 068312180A | CORD EIS CONNECTOR 8312180A |
| 350 | 850P600142 | ACTUATOR,PINCH ROLLER | CD5001 | 068315070A | CORD EIS CONNECTOR 8315070A |
| 351 | 850P800078 | SPRING,PR ACTUATOR | CD5003 | 068312156A | CORD EIS CONNECTOR 8312156A |
| 352 | 850A600007 | MAIN CHASSIS ASS'Y | CP1103 | 069R7C0049 | CONNECTOR PCB SIDE 52091-1210 |
| 353 | 850A600045 | WORM ASS'Y | D1501 | D130GMA010 | DIODE,SILICON GMA-01 |
| 354 | 850P600125 | BELT,LOADING MOTOR | H5001 | 1523D91005 | HEAD,AUDIO CONTROL HVMLA1040 |
| 355 | 850P600141 | MAIN CAM | H5002 | 1543D02002 | HEAD,FULL ERASE HVFMD0009 |
| 356 | 850A600048 | TENSION LEVER 1 ASS'Y | L1501 | 02BL000005 | ELECTRO MAGNET JTM1002-C* |
| 357 | 850A300020 | FAN SHAPED GEAR ASS'Y | M101 | 1596978003 | MOTOR,LOADING MXN13AB114 |
| 358 | 850P600118 | PLATE,FS GEAR | M2001 | 1510998004 | CAPSTAN DD UNIT DVX-7605PF |
| 359 | 850A200005 | CLUTCH ASS'Y | M2002 | 1596958006 | MOTOR,LOADING MXN13AB123 |
| 360 | 850A600053 | MB,LEVER 2 ASS'Y | PCB102 | A42301551 | PCB ASS'Y VEO1758 |
| 361 | 850A600050 | CA 2 LEVER ASS'Y | PCB103 | A41901681 | PCB ASS'Y VEO1258 |
| 362 | 850A600036 | ACTUATOR ASS'Y | PCB111(A41901681) | PCB ASS'Y VEO1248 | |
| 363 | 850A600039 | LIMITER POST LEVER ASS'Y | Q1101 | 0000800010 | TRANSISTOR PHOTO PT361 |
| 364 | 850P300059 | GEAR,M | Q1102 | 0000800010 | TRANSISTOR PHOTO PT361 |
| 365 | 850P600129 | FLANGE,P1(B) | Q1510 | 0002G00020 | PHOTO COUPLER GP2509AB |
| 366 | 850P600134 | BAND,LOADING MOTOR | R1101 | R01116103J | RC ERD-16TJ103A 10K OHM |
| 367 | 850P600122 | NUT,ADJUST X | R1501 | R01105221J | RC ERD-16TJ221 220 OHM |
| 368 | 850P600124 | BELT,REEL | R1502 | R01105331J | RC ERD-16TJ331 330 OHM |
| 369 | 850P000094 | FRAME,RIGHT SIDE | SW101 | 05501111012 | SWITCH,LEAF LSA-1121-31 |
| 370 | 868501H804 | TAP TITE(S) PAN W6 3*8 CH | SW102 | 0520343001 | SWITCH,ROTARY HWM0423-5* |
| 371 | 850P600111 | HOLDER,PHOTO COUPLER | SW103 | 0550A22003 | SWITCH,LEAF MCV0001CMF-C |
| 373 | 868491H734 | TAP TITE(S) PAN SPW+W7 3*7 CH | UN4001 | 1590D00042 | UNIT,CYLINDER CYPA2P0124 |
| 401 | 850P900258 | SPRING,REMOVING | | | |
| 402 | 850P900256 | BRACKET TOP | | | |
| 403 | 850P900261 | SPRING,LINK GEAR L | | | |
| 404 | 850P900246 | LINK GEAR L | | | |
| 405 | 850P900238 | GEAR,SYNCHRO | | | |
| 406 | 850A900047 | CASS,SIDE L ASS'Y | | | |
| 407 | 850P900267 | SHAFT,SYNCHRO | | | |
| 408 | 850P900240 | OPENER | | | |
| 409 | 850P900263 | SPRING,OPENER | | | |
| 410 | 850A900055 | CASS,SIDE R ASS'Y | | | |
| 411 | 850P900241 | FLAP OPENER | | | |
| 412 | 850P900259 | SPRING,FLAP OPENER | | | |
| 413 | 850P900247 | LINK GEAR R | | | |

MECHANICAL REPLACEMENT PARTS LIST

REF. NO PARTS NO DESCRIPTION

| | | | |
|-----|------------|----------------------------------|---------|
| 601 | 702JSB0002 | CABINET, TOP | |
| 602 | 752JSA0215 | PLATE, HEAD SHIELD M | |
| 603 | 7230001672 | FLAP | |
| 604 | 788JSE0014 | TAPPING(B0) TRUSS | 4*12 BK |
| 605 | 753JSA0015 | PLATE, DECK, EARTH | |
| 606 | 753JSA0014 | PLATE, TRANS, EARTH | |
| 607 | 702JPA0267 | CABINET, INSIDE SHEET, RATING | |
| 608 | 712JPJ0358 | DOOR | |
| 609 | A42309723 | CABINET, FRONT ASS'Y | |
| 610 | 702JSA0019 | CABINET, BOTTOM | |

| | | | |
|-----|------------|---------------------|---------|
| 701 | 8102230604 | BIND | M3*6 CH |
| 702 | 8102230408 | BIND | M3*4 RD |
| 703 | 8102240804 | BIND | M4*8 CH |
| 704 | 8110630804 | TAP TITE(P) BRAZIER | 3*8 CH |
| 705 | 8112630A48 | TAPPING(B0) BRAZIER | 3*14 RD |
| 706 | 8112240A01 | TAPPING(B0) BIND | 4*10 NI |
| 707 | 811263CA08 | TAPPING(B0) BRAZIER | 3*10 RD |
| 708 | 8117330A08 | TAPPING(B0) FLAT | 3*10 RD |

--- JPCBVTA01A INSTRUCTION BOOK
 --- JSCBVTA20A CAUTION SHEET
 --- 791JHA0082 GIFT SHEET
 --- 792JHA0144 PACKAGE
 --- 793JCD1815 GIFT BOX

THIS ELECTRICAL PARTS LIST IS STANDARD PART LIST, BUT ACTUALLY
INTERCHANGEABLE PARTS MAY BE USED IN THE UNIT.
SEE THE INTERCHANGEABLE PARTS LIST AFTER THE STANDARD PARTS LIST.

ELECTRICAL REPLACEMENT PARTS LIST

| REF. NO | PARTS. NO | DESCRIPTION | REF. NO | PARTS. NO | DESCRIPTION |
|--------------------------|-------------|------------------------|----------------|-----------|-------------|
| -RESISTORS- | | | | | |
| ▲ REC* | R61584680J | R.FUSE | 68 | OHM 1/4W | |
| -CAPACITORS- | | | | | |
| C5C2 | E031F3472M | CE | 4700 | UF 25V | |
| C5C3 | E011F3222M | CE | 2200 | UF 25V | |
| C5C32 | P341F2273J | CPP | 0.027 | UF 200V | |
| C5C34 | E011T5010M | CE | 1 | UF 50V | |
| C6506 | E011F5R47M | CE | 0.47 | UF 50V | |
| -SEMICONDUCTORS- | | | | | |
| ▲ D5C1 | D13TDS442X | DIODE,SILICON | DS442X-BT | | |
| ▲ D5C2 | D13TDS442X | DIODE,SILICON | DS442X-BT | | |
| ▲ D5C3 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D5C4 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D5C5 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D5C6 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D5C7 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D5C8 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D5C9 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| ▲ D510 | D23TDSF10T | DIODE,RECTIFIER | DSF10TB-BT-A | | |
| D511 | D28T011E20 | DIODE,SILICON | 11E2TA1 | | |
| D512 | D28T011E20 | DIODE,SILICON | 11E2TA1 | | |
| △ D513 | D87T2MR150 | DIODE,GLASS SEALED LED | LTZ-MR15-T77 | | |
| D514 | D940CZ27CP | DIODE,ZENER | HZ27CP | | |
| D515 | D93T01300X | DIODE,ZENER | GZA13 X BT | | |
| D516 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D517 | D28T011E51 | DIODE,SILICON | 11E51 | | |
| D518 | D28T011E51 | DIODE,SILICON | 11E51 | | |
| D606 | 002135A010 | LED | SLP-236B-25 | | |
| D607 | 002135A010 | LED | SLP-236B-25 | | |
| D608 | 002135A010 | LED | SLP-236B-25 | | |
| D609 | 0021320100 | LED | SLP136C-20B | | |
| D625 | D94UA6R2J2 | DIODE,ZENER | HZS6R2J82-T | | |
| D1C01 | D17T001320 | DIODE,SILICON | ISS132T-77 | | |
| D1C04 | D17T001320 | DIODE,SILICON | ISS132T-77 | | |
| D1005 | D13TDS442X | DIODE,SILICON | DS442X-BT | | |
| D1006 | D28T011E10 | DIODE,SILICON | 11E1TA1-T | | |
| D2006 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2007 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2008 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2009 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2010 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2011 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2015 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2016 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2017 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2018 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2019 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D2020 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D3001 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D4001 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D4002 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D4003 | D13TGM010 | DIODE,SILICON | GMA-01-BT | | |
| D4201 | D94TA130J2 | DIODE,ZENER | HZS13JB2-TE | | |
| D6001 | D03RLFB01L | DIODE,SILICON | LFB-01L | | |
| D6002 | D14U001660 | DIODE,SILICON | ISS166-03TE | | |
| D6003 | D03RLFB01L | DIODE,SILICON | LFB-01L | | |
| D6502 | D03RLFB01L | DIODE,SILICON | LFB-01L | | |
| ▲ IC501 | I23S953320 | INTEGRATED CIRCUIT | STK5332 | | |
| IC502 | I02109574J | INTEGRATED CIRCUIT | UPC574J-T | | |
| IC601 | I510T8007A | INTEGRATED CIRCUIT | OEC8007 | | |
| IC602 | I31D012250 | INTEGRATED CIRCUIT | MN1225 | | |
| IC603 | I01901280M | INTEGRATED CIRCUIT | MN1280 | | |
| IC1001 | I54050010C | INTEGRATED CIRCUIT | OEC0010C | | |
| IC1002 | I06S51954A | INTEGRATED CIRCUIT | M51954AL | | |
| IC1003 | I07S06239N | INTEGRATED CIRCUIT | BA6239AN | | |
| IC1004 | I03S063930 | INTEGRATED CIRCUIT | LA6393S | | |
| IC2001 | I97D49005A | INTEGRATED CIRCUIT | OEC9005 | | |
| IC2002 | I03S063930 | INTEGRATED CIRCUIT | LA6393S | | |
| IC2003 | I03D063240 | INTEGRATED CIRCUIT | LA6324 | | |
| IC2004 | I03S063930 | INTEGRATED CIRCUIT | LA6393S | | |
| IC2005 | I07D003240 | INTEGRATED CIRCUIT | BA10324 | | |
| IC3001 | I05D386440 | INTEGRATED CIRCUIT | TA8644N | | |
| IC3701 | I07TC7025L | INTEGRATED CIRCUIT | BA7025L | | |
| IC4001 | I04D380140 | INTEGRATED CIRCUIT | HA118014NT | | |
| IC4002 | I04D317870 | INTEGRATED CIRCUIT | HA11787 | | |
| IC4101 | I07DG7212S | INTEGRATED CIRCUIT | BA7212S | | |
| IC5001 | I07T67751L | INTEGRATED CIRCUIT | BA7751LS | | |
| IC5002 | I07S077550 | INTEGRATED CIRCUIT | BA7755 | | |
| -SEMICONDUCTORS (CONT)- | | | | | |
| IC6001 | I03DA7530N | INTEGRATED CIRCUIT | LA7530N | | |
| IC6101 | I03D06358T | INTEGRATED CIRCUIT | LA6358T | | |
| IC6501 | I03S072100 | INTEGRATED CIRCUIT | LA7210 | | |
| ▲ Q501 | TA3T0984K0 | TRANSISTOR,SILICON | 2SA984K-T | | |
| ▲ Q502 | TD30016660 | TRANSISTOR,SILICON | 2SD1666 | | |
| Q503 | TN7TB03001 | COMPOUND TRANSISTOR | 2SC3402-T | | |
| Q504 | TN7TB03001 | COMPOUND TRANSISTOR | 2SC3402-T | | |
| ▲ Q505 | TD30018250 | TRANSISTOR,SILICON | 2SD1825 | | |
| Q506 | TD3T007340 | TRANSISTOR,SILICON | 2SD734-T | | |
| ▲ Q507 | TC3T02274F | TRANSISTOR,SILICON | 2SC2274F-T | | |
| Q601 | TN7TB03001 | COMPOUND TRANSISTOR | DTC114E S-T | | |
| Q602 | TN7TB03001 | COMPOUND TRANSISTOR | DTC114E S-T | | |
| Q603 | TN7TB03001 | COMPOUND TRANSISTOR | DTC114E S-T | | |
| Q604 | TN7TB03001 | COMPOUND TRANSISTOR | DTC114E S-T | | |
| Q605 | TP7TC03001 | COMPOUND TRANSISTOR | DTA124E S-T | | |
| Q606 | TN7TD03001 | COMPOUND TRANSISTOR | DTC144E S-T | | |
| Q1001 | TD3T011110 | TRANSISTOR,SILICON | 2SD1111-T | | |
| Q1002 | TN7TC03001 | COMPOUND TRANSISTOR | DTC124E S-T | | |
| Q1003 | TC3T022740 | TRANSISTOR,SILICON | 2SC2274 | | |
| Q1004 | TN7TC03001 | COMPOUND TRANSISTOR | DTC124E S-T | | |
| Q1005 | TB3T006980 | TRANSISTOR,SILICON | 2SB698-AA | | |
| Q2003 | TN7TC03001 | COMPOUND TRANSISTOR | DTC124E S-T | | |
| Q2004 | TN7TC03001 | COMPOUND TRANSISTOR | DTC124E S-T | | |
| Q2005 | TN7TB03001 | COMPOUND TRANSISTOR | DTC114E S-T | | |
| Q2006 | TP7TC03001 | COMPOUND TRANSISTOR | DTA124E S-T | | |
| Q2013 | TAT7T009330 | TRANSISTOR,SILICON | 2SA933-T | | |
| Q2014 | TN7TC03001 | COMPOUND TRANSISTOR | DTC124E S-T | | |
| Q3001 | TA3T0608K0 | TRANSISTOR,SILICON | 2SA608KNP-T | | |
| Q3003 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q3004 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q3005 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q3006 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q3007 | TN3TB03001 | COMPOUND TRANSISTOR | 2SC3402-T | | |
| Q3701 | TN3TC03001 | COMPOUND TRANSISTOR | 2SC3400-T | | |
| Q3702 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q4001 | TN3TC03001 | COMPOUND TRANSISTOR | 2SC3400-T | | |
| Q4003 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q4005 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q4006 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q4101 | T87A02412K | TRANSISTOR,SILICON | 2SC2412K | | |
| Q4102 | T87A02412K | TRANSISTOR,SILICON | 2SC2412K | | |
| Q4105 | T87A02412K | TRANSISTOR,SILICON | 2SC2412K | | |
| Q4201 | TN3TD03001 | COMPOUND TRANSISTOR | 2SC3399-AC | | |
| Q4204 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q4205 | TA3T0608K0 | TRANSISTOR,SILICON | 2SA608KNP-T | | |
| Q4206 | TN3TC03001 | COMPOUND TRANSISTOR | 2SC3400-T | | |
| Q4207 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q5001 | TN3TC05001 | COMPOUND TRANSISTOR | 2SC3395(CY)-TA | | |
| Q5005 | TC1T013170 | TRANSISTOR,SILICON | 2SC1317-T | | |
| Q6001 | T83A028120 | TRANSISTOR,SILICON | 2SC2812-TA | | |
| Q6002 | T63A011790 | TRANSISTOR,SILICON | 2SA1179-TA | | |
| Q6003 | TN3TC05001 | COMPOUND TRANSISTOR | 2SC3395(CY)-T | | |
| Q6004 | T83A028140 | TRANSISTOR,SILICON | 2SC2814-TA | | |
| Q6005 | T83A028120 | TRANSISTOR,SILICON | 2SC2812-TA | | |
| Q6101 | TC3T0536S0 | TRANSISTOR,SILICON | 2SC536SP-AC | | |
| Q6102 | T83T006980 | TRANSISTOR,SILICON | 2SB698-AA | | |
| Q6103 | TB3T006980 | TRANSISTOR,SILICON | 2SB698-AA | | |
| Q6104 | TB3T006980 | TRANSISTOR,SILICON | 2SB698-AA | | |
| Q5501 | T83A028120 | TRANSISTOR,SILICON | 2SC2812-TA | | |
| Q6502 | TN3TC05001 | COMPOUND TRANSISTOR | 2SC3396(CY)-TA | | |
| - COILS & TRANSFORMERS - | | | | | |
| L3001 | 021673331K | COIL | EL0606RA-331K | 330 | UH |
| L3002 | 021JA6180K | COIL | LAL02T180K-T | 18 | UH TA |
| L3003 | 021673101K | COIL | EL0606RA-101K | 100 | UH |
| L3005 | 021JA6150K | COIL | LAL02T150K-T | 15 | UH TA |
| L3006 | 021673681K | COIL | EL0606RA-681K | 680 | UH |
| L3702 | 0326220011 | COIL,TRAP | | 2622001 | |
| L4001 | 021JA6470K | COIL | LAL02T470K-T | 47 | UH TA |
| L4002 | 021JA6820K | COIL | LAL02T820K-T | 82 | UH TA |
| L4003 | 021JA68R2K | COIL | LAL02T8R2K-T | 8.2 | UH TA |
| L4004 | 021JA68R2K | COIL | LAL02T8R2K-T | 8.2 | UH TA |
| L4007 | 021673101K | COIL | EL0606RA-101K | 100 | UH |
| L4008 | 021JA6470K | COIL | LAL02T470K-T | 47 | UH TA |
| L4009 | 021673101K | COIL | EL0606RA-101K | 100 | UH |
| L4101 | 021JA65R6K | COIL | LAL02T5R6K-T | 5.6 | UH TA |
| L4104 | 021673101K | COIL | EL0606RA-101K | 100 | UH |
| L4105 | 021JA6180K | COIL | LAL02T180K-T | 18 | UH TA |
| L4106 | 021JA62R7K | COIL | LAL02T2R7K-T | 2.7 | UH TA |
| L4107 | 021JA6330K | COIL | LAL02T330K-T | 33 | UH TA |
| L4108 | 021673101K | COIL | EL0606RA-101K | 100 | UH |
| L4109 | 021JA65R6K | COIL | LAL02T5R6K-T | 5.6 | UH TA |
| L4111 | 021JA6151K | COIL | LAL02T151K-T | 150 | UH TA |

ELECTRICAL REPLACEMENT PARTS LIST

| REF. NO | PARTS.NO | DESCRIPTION | REF. NO | PARTS.NO | DESCRIPTION |
|--------------------------------|-------------------------------|----------------------|------------------------|----------|---|
| - COILS & TRANSFORMERS (CONT)- | | | | | |
| L4112 | 021JA6180K | COIL LAL02T180K-T | 18 | UH TA | CD502 1224031102 CORD JUMPER |
| L4202 | 021673101K | COIL EL0606RA-101K | 100 | UH | CP501 069R980019 CONNECTOR PCB SIDE |
| L5C01 | 021673102K | COIL EL0606RA-102K | 1000 | UH | CP502 069R980019 CONNECTOR PCB SIDE |
| L5C02 | 021673102K | COIL EL0606RA-102K | 1000 | UH | CV501 12AL10002A COVER AC CORD |
| L5003 | 021679682K | COIL EL0909RR-682K | 6.8 | MH | CY601 06942A0060 CONNECTOR PCB SIDE |
| L6001 | 021JA682M | COIL LAL02TR82M-T | 0.82 | UH TA | CY602 06942A0060 CONNECTOR PCB SIDE |
| L6002 | 021J96100K | COIL LAL02T100K | 10 | UH NA | CY603 0694270060 CONNECTOR PCB SIDE |
| L6003 | 021JA6100K | COIL LAL02T100K-T | 10 | UH TA | CD2002 068327009A CORD EIS CONNECTOR |
| L6004 | 0336000137 | COIL,VIDEO IFT | 36000013 | | CD2003 12260C1501 CORD JUMPER |
| L6005 | 0336000107 | COIL,VIDEO IFT | 3600010(F370A) | | CD2004 1226092101 CORD JUMPER |
| L6C06 | 021JA6270K | COIL LAL02T270K-T | 27 | UH TA | CD2501 068R78001A CORD EIS CONNECTOR |
| L6007 | 021JA65R6K | COIL LAL02T5R6K-T | 5.6 | UH TA | CD2504 068R78001A CORD EIS CONNECTOR |
| L6008 | 021673101K | COIL EL0606RA-101K | 100 | UH | CD4102 068329005A CORD EIS CONNECTOR |
| L6009 | 0336000057 | COIL,VIDEO IFT | 3600005(E693X) | | CD6001 0682H05001 CORD COAXIAL |
| L6501 | 021JA6101K | COIL LAL02T101K-T | 100 | UH TA | CD6002 068OL05004 CABLE,PAL |
| - MISCELLANEOUS (CONT)- | | | | | |
| ▲ T501 | 0405570101 | TRANSFORMER,POWER AC | 0557010 | | CF3701 10114R1703 FILTER,CERAMIC |
| T5001 | 0336260011 | COIL,BIAS OSC | 3626001 | | CF6001 102703891 FILTER,SAW |
| - JACK & CONNECTORS- | | | | | |
| J4001 | 0635500004 | JACK PLATE | TSJ-4-2YW | | CF6002 101225R502 FILTER,CERAMIC |
| -SWITCHES- | | | | | |
| SW603 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | CF6003 101105R501 FILTER,CERAMIC |
| SW604 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | CF6004 101115R502 FILTER,CERAMIC TRAP |
| SW605 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | EFCSS5R5MS4 |
| SW606 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | EFCSS5R5MW3 |
| SW607 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW608 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW611 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW612 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW613 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW614 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW615 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW616 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW617 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW618 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW619 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW620 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW621 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW622 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW623 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| SW624 | 0504101S01 | SWITCH TACT | EVQ-QSV05K | | |
| -VARIABLE RESISTORS- | | | | | |
| VR601 | V014025B01 | VR,ROTARY | EVU-F3AM20B25 | | F503 080ET1R201 FUSE |
| VR2001 | V1263Q5B01 | VR,SEMI FIXED | RHEOASS50HB(H0615C123) | | FH501 067H000003 HOLDER,FUSE |
| VR2002 | V126315B01 | VR,SEMI FIXED | RHEOA150KB(H0615C119) | | ▲ ICP201 08477TR402 IC PROTECTOR |
| VR3001 | V126315B01 | VR,SEMI FIXED | RHEOA150KB(H0615C119) | | ▲ ICP501 08477TR2501 IC PROTECTOR |
| VR4001 | V126313B01 | VR,SEMI FIXED | RHEOA130FB(H0615C107) | | OS601 0771006003 REMOTE RECEIVER |
| VR4002 | V1263H3B01 | VR,SEMI FIXED | RHEOAJ309B(H0615C109) | | PF3001 1147L15605 FILTER,LOW PASS |
| VR4003 | V146322B01 | VR,SEMI FIXED | VM6CKPV(1)B200 | | PF3002 1147B44606 FILTER,BAND PASS |
| VR4004 | V1263U3B01 | VR,SEMI FIXED | RHEOAW30EB(H0615C112) | | PF3003 1147B50604 FILTER,BAND PASS |
| VR4005 | V1263H3B01 | VR,SEMI FIXED | RHEOAJ309B(H0615C109) | | PF4001 1147L30603 FILTER,LOW PASS |
| VR4006 | V1263Q4B01 | VR,SEMI FIXED | RHEOAS40CA(H0615C117) | | PF4002 1147L30603 FILTER,LOW PASS |
| VR4101 | V126213B01 | VR,SEMI FIXED | RHEON130BB(H0614C207) | | PF4101 1147H14605 FILTER,HIGH PASS |
| VR4102 | V1262H3B01 | VR,SEMI FIXED | RHEONJ306B(H0614C209) | | PF4201 103802R102 DELAY |
| VR5001 | V126214B01 | VR,SEMI FIXED | RHEON140CB(H0614C213) | | PF5001 032623001A COIL,TRAP |
| VR5002 | V1262Q5B03 | VR,SEMI FIXED | RH0622A023-470KB | | RN1001 110E447202 R,NETWORK |
| VR6001 | V126214B01 | VR,SEMI FIXED | RHEON140CB(H0614C213) | | RN1002 1101322302 R,NETWORK |
| VR6002 | V126214B01 | VR,VEMI FIXED | RHEON140CB(H0614C213) | | RN1003 1101322302 R,NETWORK |
| -P.C.BOARDS ASS'Y- | | | | | |
| PCB101 | A42309010 | PCB ASS'Y | VV00838 | | TH4001 DS1FL802S0 THERMISTOR |
| PCB301 | A42309300 | PCB ASS'Y | VV0081M | | ▲ TU6001 0145201009 TUNER,UHF-VHF |
| PCB401 | A42309330 | PCB ASS'Y | VE0182B | | ▲ TU6002 0151101008 RF-CONVERTER |
| PCB501 | A42309020 | PCB ASS'Y | VP0044B | | V601 096270R302 TUBE FLUORESCENT DISPLAY FIP1ISM7 |
| PCB502(A42309020) | PCB ASS'Y | | VE0183B | | X601 100E4R1906 CRYSTAL |
| PCB601 | A42309270 | PCB ASS'Y | VE0173B | | X602 100D32R801 CRYSTAL |
| PCB602 | A42309240 | PCB ASS'Y | VEU174B | | X1001 100D4R0002 CERAMIC OSCILLATOR |
| -MISCELLANEOUS- | | | | | |
| BT501 | 1412004001 | BATTERY,MANGAN | UM-4(SP) | | RESISTOR |
| ▲ CD501 | 1204450017 | CORD AC BUSH | E2N | 7FEET | RC.....CARBON RESISTOR |
| CAPACITORS | | | | | |
| CC..... | CERAMIC CAPACITOR | | | | |
| CE..... | ALUMI ELECTROLYTIC CAPACITOR | | | | |
| CP..... | POLYESTER CAPACITOR | | | | |
| CPP..... | POLYPROPYLENE CAPACITOR | | | | |
| CPL..... | PLASTIC CAPACITOR | | | | |
| CMP..... | METAL POLYESTER CAPACITOR | | | | |
| CMPL..... | METAL PLASTIC CAPACITOR | | | | |
| CMPP..... | METAL POLYPROPYLENE CAPACITOR | | | | |
| CST..... | STYROL CAPACITOR | | | | |

INTERCHANGEABLE PARTS LIST

NOTE: THE FOLLOWING PART(S) MAY BE SUBSTITUTED FOR PARTS INDICATED
IN THE BASIC PART(S) LIST (WITH THE SAME REF.NO.). THESE PARTS
SHARE THE SAME ELECTRICAL CHARACTERISTICS AND OTHER ELEMENTS
FOR COMMON USAGE. EITHER PART NUMBER MAY BE USED IN THIS UNIT.

| REF. NO | DESCRIPTION | DESCRIPTION |
|---------|-------------------------------|-------------------------------|
| TH4001 | ERT-D2ZHL802S (DS1FL802SO) | ERT-D2FHL802S (DS1OL802SO) |